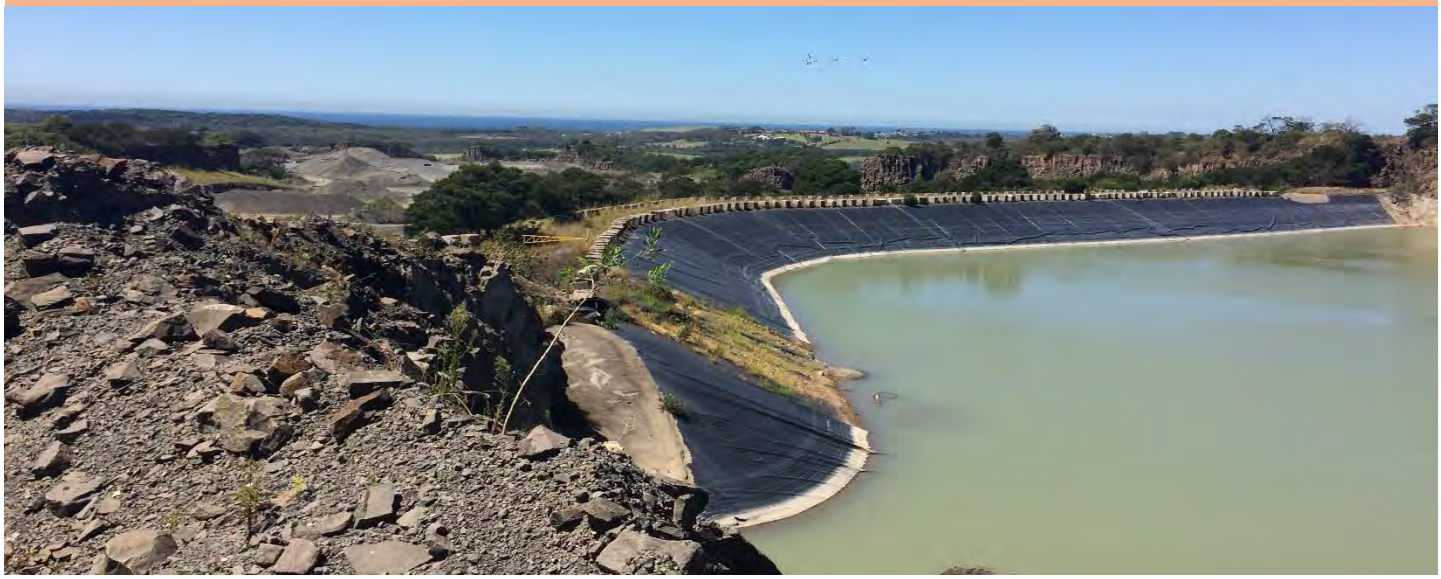
ARCADIS Design & Consultancy for natural and built assets

DUNMORE HARD ROCK QUARRY

Rehabilitation Management Plan

15 NOVEMBER 2016



Incorporating Hyder

CONTACT

BRAD SEARLE
Business Leader - Environment

T 02 8907 9000
E brad.searle@arcadis.com

Arcadis
Level 5 Walker Street
North Sydney NSW 2060

BORAL
DUNMORE HARD ROCK QUARRY

Rehabilitation Management Plan

Author	Danielle Haynes	
Checker	Brad Searle	
Approver	Brad Searle	

Report No	AA009002
Date	15/11/2016
Revision Text	Revision C

REVISIONS

Revision	Date	Description	Prepared by	Approved by
A	27/06/2016	Draft Rehabilitation Management Plan	DH	BS
B	2/8/2016	Draft Rehabilitation Management Plan	DH	BS
C	15/11/2016	Final Rehabilitation Management Plan	DH	BS

CONTENTS

APPENDICES

1 INTRODUCTION

1.1 Background

The Dunmore Hard Rock Quarry (DHQ), owned and operated by Boral Resources (NSW) Pty Ltd, is located at Tabbita Road Dunmore, approximately 12 kilometres north-west of Kiama in the Shellharbour Local Government Area. The quarry produces hard rock which is crushed to produce coarse aggregates and road construction materials, and fines that are used as manufactured sand or bedding material.

Development Consent (DA 470-11-2003), issued 19 November 2004 by the Minister for Infrastructure and Planning, authorises Boral to produce up to 2.5 million tonnes of hard rock a year (Mtpa), and transport it offsite by road and rail to local and regional markets.

The project approval requires the preparation and implementation of a number of management plans to guide the environmental management of the development throughout its operational life. In accordance with Condition of Approval (CoA) 54, a Flora and Fauna Management and Rehabilitation Plan (FFRMP) was prepared by Cumberland Ecology for Boral in 2009.

Since consent was issued in November 2004, there have been six approved modifications (with conditions), as detailed below:

1. Modification 1 - December 2005
2. Modification 2 – June 2006
3. Modification 3 – May 2008
4. Modifications 4 and 5 – November 2008
5. Modification 6 – Increased extraction area and road haulage, February 2014.
6. Modification 7 – Proposed Blending Plant – December 2015.

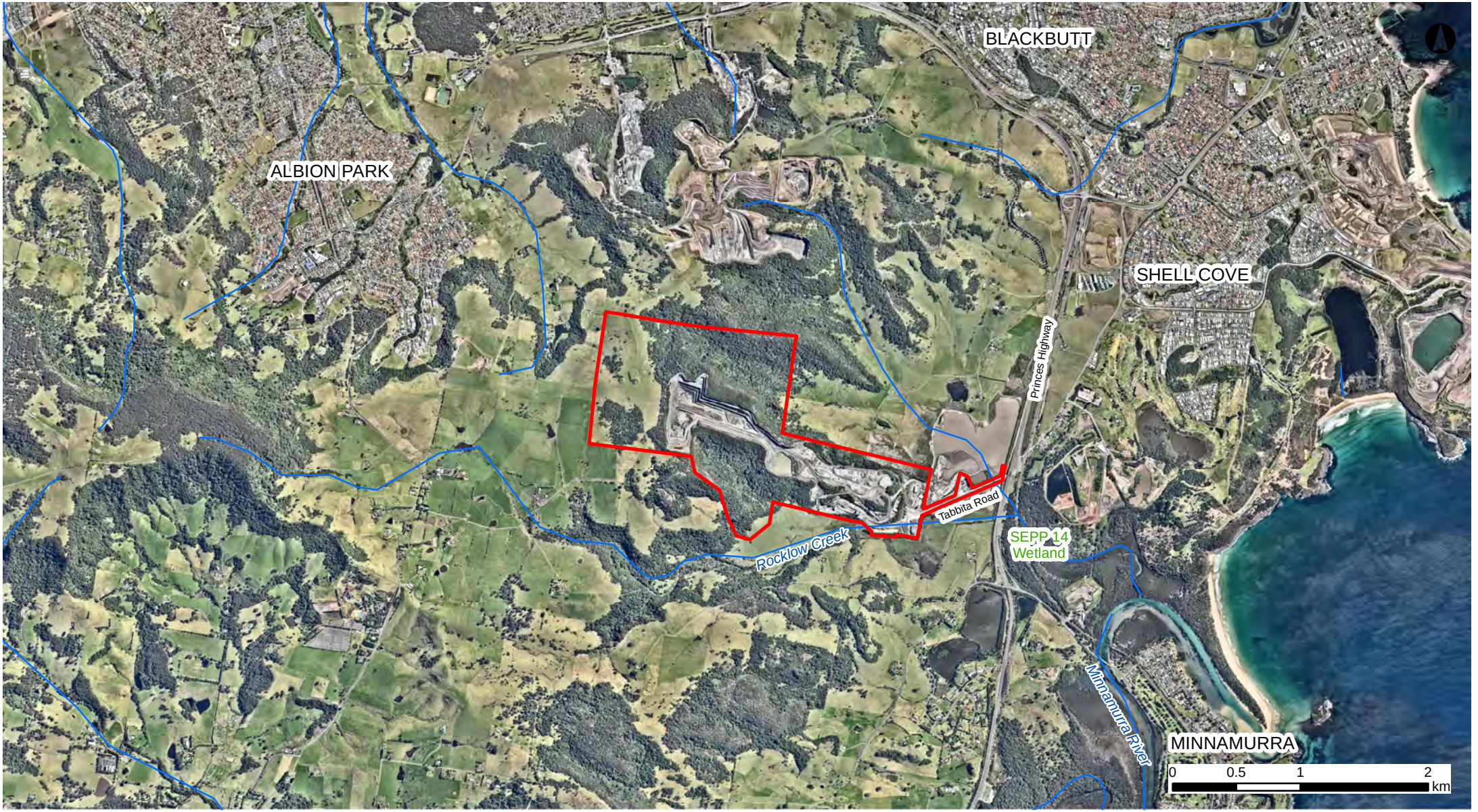
To reflect this progression in Dunmore Quarry's operations, Boral has requested that the existing Rehabilitation Management Plan (previously included within the 2009 FFRMP) be updated, in accordance with the current quarry activities, existing management of vegetated areas and future rehabilitation of the site to support complementary landforms and landuses post quarrying operations.

1.2 Project description

Dunmore Hard Rock Quarry (the site) covers approximately 248 hectares and is surrounded by private property, predominantly agricultural grazing land and tracts of remnant native vegetation, to the south, north and west (Figure 1). Dunmore Soil and Sand Quarry adjoins the site to the east.

DHQ produces hard rock from Bumbo Latite Member, a fine-grained intermediate volcanic rock similar to basalt, which is crushed to produce coarse aggregates, road construction materials and fines. Extraction occurs from three discrete areas: Original Quarry, Croome Farm Pit and Rail Infrastructure Corporation land (RIC Slot). These areas are described in further detail in Section 3.1.

The extraction method involves drilling and blasting to produce broken rock, that is transported to the primary crusher feed bin. The primary-crushed rock is further reduced in size in a series of crushers, before being conveyed to the tertiary screen house where the crushed rock is sized according to product specifications. The sized products are then stockpiled within the various stockpile areas on site, until they are transported by road and rail to local and regional markets. A detailed description of DHQ's operations is provided by *Environmental Impact Statement for the proposed Dunmore Quarry Production Increase* (Corkery & Co 2003).



LEGEND

Site Boundary

Watercourse

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 5, 141 Walker St | North Sydney NSW 2060
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

ARCADIS

Figure 1 Site Locality (June 2016)

Date: 14/11/2016 Path: F:\AA009002\L-GIS\A_Current\B_Maps\AA009002_013_DHQ_SiteLocality_A4_v2.mxd
Created by : NS
QA by : RB

1.3 Purpose and Objectives of the Plan

The purpose of this Rehabilitation and Management Plan (RMP) is to meet the requirements of summary environmental management measures and DA conditions of consent applicable to rehabilitation. This RMP has been prepared in accordance with Schedule 3, Condition 54 of DA 470-11-2003. The overall objectives of the RMP, as derived from these conditions, are to describe:

1. The disturbed area at the site
2. The short, medium and long term rehabilitation measures for the site that would be implemented
3. The measures that would be implemented over the next five years, including the procedures to be implemented for:
    - Ensuring compliance with the rehabilitation objectives and progressive rehabilitation obligations in this approval
    - Optimising the use of available weathered rock and soil as a substrate for vegetation.
4. A final stable landform able to support a range of suitable alternative final land uses
5. The management actions that will minimise the environmental impacts of site operations and to ensure the progressive rehabilitation is completed as soon as possible
6. Who would be responsible for monitoring, reporting, reviewing and implementing the plan.

Additionally, this RMP provides a single operational document that clearly identifies key management objectives and actions to be implemented, the proposed schedule for implementation or the monitoring and review of commitments.

1.4 Alignment with Other Plans

This document builds upon the information included in the existing *Flora and Fauna Management and Rehabilitation Plan* prepared by Cumberland Ecology (2009).

A number of other management plans apply to the DHQ Site and the RMP including the Water Management Plan (Arcadis 2016) and Flora and Fauna Management Plan (FFMP) (Arcadis 2016). The management actions in these plans complement these plans and as such management actions comprised within these require holistic consideration.

1.5 Document Structure

The structure of this RMP is outlined in Table 1.

Table - 1 Structure of this RMP

Section	Content
1	Provides an overview of the project, previous environmental assessments of the Project, and the purpose and scope of this plan.
2	Details the statutory requirements for the Plan as outlined in the Conditions of Approval issued by the NSW Department of Planning and Infrastructure and other legislative requirements.
3	Describes the existing environment of the site, including biodiversity values contained within the site and the various conservations areas in which management actions are proposed
4	Describes the management actions to be undertaken to effectively implement and manage the rehabilitation values of the study area.
5	Summarises the rehabilitation management actions to be undertaken
6	Specifies the environmental induction training delivered to all staff and subcontractors involved in the Project.
7	Outlines the requirement pertaining to contingency planning, including emergency incident reporting and management.
8	Outlines the monitoring, reporting and review requirements pertaining to rehabilitation management within the study area.
9	Lists the references used in the preparation of this plan

2 RELEVANT LEGISLATION, GUIDELINES AND PLANS

2.1 Legislation

Key environmental legislation relating to flora and fauna management includes:

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *NSW Threatened Species Conservation Act 1995* (TSC Act)
- *NSW Fisheries Management Act 1994* (FM Act)
- *NSW Environment Planning and Assessment Act 1979* (EP&A Act)
- *NSW Protection of the Environment and Operations Act 1997* (POEO Act)
- *NSW National Parks and Wildlife Act 1974* (NPW Act)
- *NSW Noxious Weeds Act 1993* (NW Act)
- *NSW Native Vegetation Act 2003* (NV Act)
- *NSW Water Management Act 2000* (WM Act)
- *Mining Act 1992*
- *Illawarra Regional Environmental Plan No. 1*
- *Shellharbour Local Environmental Plan 2013*
- *Shellharbour Rural Local Environmental Plan 2004*
- *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries 2007.*

2.2 Guidelines

Department of Industry Resources and Energy *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* provides guidance in the preparation of Mine Operations Plans (MOP), Mine Closure Plans (MCP) and Annual Reviews (AR). The guideline document aims to enable mining activities throughout NSW to proceed safely, efficiently extract resources, protect the environment and deliver a rehabilitated landform at the completion of mining activities.

This Rehabilitation Management Plan aligns with the intent of this Guideline document.

The rehabilitation process requires the establishment of a performance framework in order to measure the success of the rehabilitation process and to facilitate a consistent approach. The ANZMEC (Australian and New Zealand Minerals and Energy Council) Strategic Framework (2000) provides a framework for rehabilitation and performance assessment for mining operations.

The performance framework should cover the following:

- Rehabilitation principles and objectives, including final land use;
- Decommissioning requirements;
- Community objectives and criteria;
- Consent criteria;
- Standards and issues related to whole-of-life considerations;
- Financial costing and provisioning;
- Legal requirements;
- Environmental and social management requirements; and
- Safety considerations.

2.3 Conditions of Approval

The quarry operates under a Ministerial consent granted on 19 November 2004 issued for the Development Application DA 470-11-2003. Since the consent was issued there have been six approved modifications (with conditions), as detailed below:

- Modification 1 - December 2005
- Modification 2 – June 2006
- Modification 3 – May 2008
- Modifications 4 and 5 – November 2008
- Modification 6 – Increased extraction area and road haulage, February 2014
- Modification 7 – Proposed Blending Plant – December 2015.

A number of the Ministers Conditions of Approval (MCoA) from the NSW Department of Planning and Infrastructure (February 2014) are relevant to this Plan and have been considered in its preparation. An overview of how this plan addresses MCoA requirements applicable to rehabilitation is outlined in Table 1.

Table 2 - Rehabilitation Management Plan MCoA Compliance Requirements

Condition of Approval	Condition Requirements	Where addressed in this document
Rehabilitation Management Plan		
3(54)	Within 6 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Rehabilitation Management Plan for the site to the satisfaction of the Director- General. This plan must:	This Plan
	(a) identify the disturbed area at the site;	Section 3
	(b) describe in general the short, medium, and long-term measures that would be implemented to rehabilitate the site;	Section 4
	(c) describe in detail the measures that would be implemented over the next 5 years to rehabilitate the site; and	Sections 4 and 5
	(d) describe how the performance of these measures would be monitored over time.	Section 7
3(55)	Within 5 years of providing the Rehabilitation Management Plan to the Director-General, and every 5 years thereafter, the Applicant shall review and update the plan to the satisfaction of the Director- General.	Section 7
Rehabilitation and Conservation Bond		
3(56)	Within 6 months of the date of this consent, the Applicant shall lodge a suitable rehabilitation and conservation bond for the development with the Director-General. The sum of the bond shall be calculated at: (a) \$2.50/ m_2 for the area of disturbance at the development; and (b) \$3.00 /m_2 of the area of the compensatory habitat proposal (see Condition 49 above) to the satisfaction of the Director-General.	Section 6

2.4 Licences and permits

2.4.1 Environmental Protection Licence

The Environment Protection Authority (EPA) issues environment protection licences to the owners or operators of various industrial premises under the *Protection of the Environment Operations Act 1997* (POEO Act). Licence conditions relate to pollution prevention and monitoring, and cleaner production through recycling and reuse and the implementation of best practice. All licence holders must:

- Comply with the conditions of their licence
- Prepare pollution incident response management plans
- Publish and/or make pollution monitoring data available.

Dunmore Quarry operates in accordance with Environmental Protection Licence No. 77. This licence is renewed annually (Anniversary Date is 31 August) and includes specific criteria that need to be satisfied with respect to blasting, dust and water monitoring, and annual environmental returns and reporting. The licence has most recently been updated on 26 September 2015.

3 SITE CONTEXT

3.1 Site Description

The site covers approximately 248 hectares and includes the existing hard rock extraction areas, processing plant, stockpiles of sized products, a workshop and maintenance area, the rail siding and product loading area, several dams, administration buildings, a carpark and weighbridge (Figure 1). The site also contains a concrete batching plant, which operates under a separate development consent granted by Shellharbour City Council on 4 December 1997. These operational areas are surrounded by a mosaic of large remnants of native vegetation and expanses of cleared and disturbed grassland.

Historically, extraction has occurred in an area known as the Original Quarry. Extraction operations are currently centred on the Croome Farm Pit and Rail Infrastructure Corporation (RIC) Slot extraction areas (Figure 2).

Original Quarry

Extraction from the Original Quarry, located on Boral-owned land, commenced in 1921. The original quarry contains approximately 2.5 million m^3 of breccia- agglomerate above approximately 12 Mt of latite in the lower flow. Extraction involves the progressive removal of a breccia-agglomerate (likely to be suitable for production of road pavement materials) and the eventual recovery of high quality latite from the lower flow. There is no limit on the extraction rate from the original quarry.

The existing extraction floor in the Original Quarry slopes gradually to the east. Elevations of the floor vary from 30mAHD to 60mAHD and there are localised faces where some of the agglomerate has been extracted. The outer faces of the Original Quarry have been retained to assist in screening exposed extraction faces and stockpiled by-products on the quarry floor (Corkery & Co 2003).

Croome Farm Pit

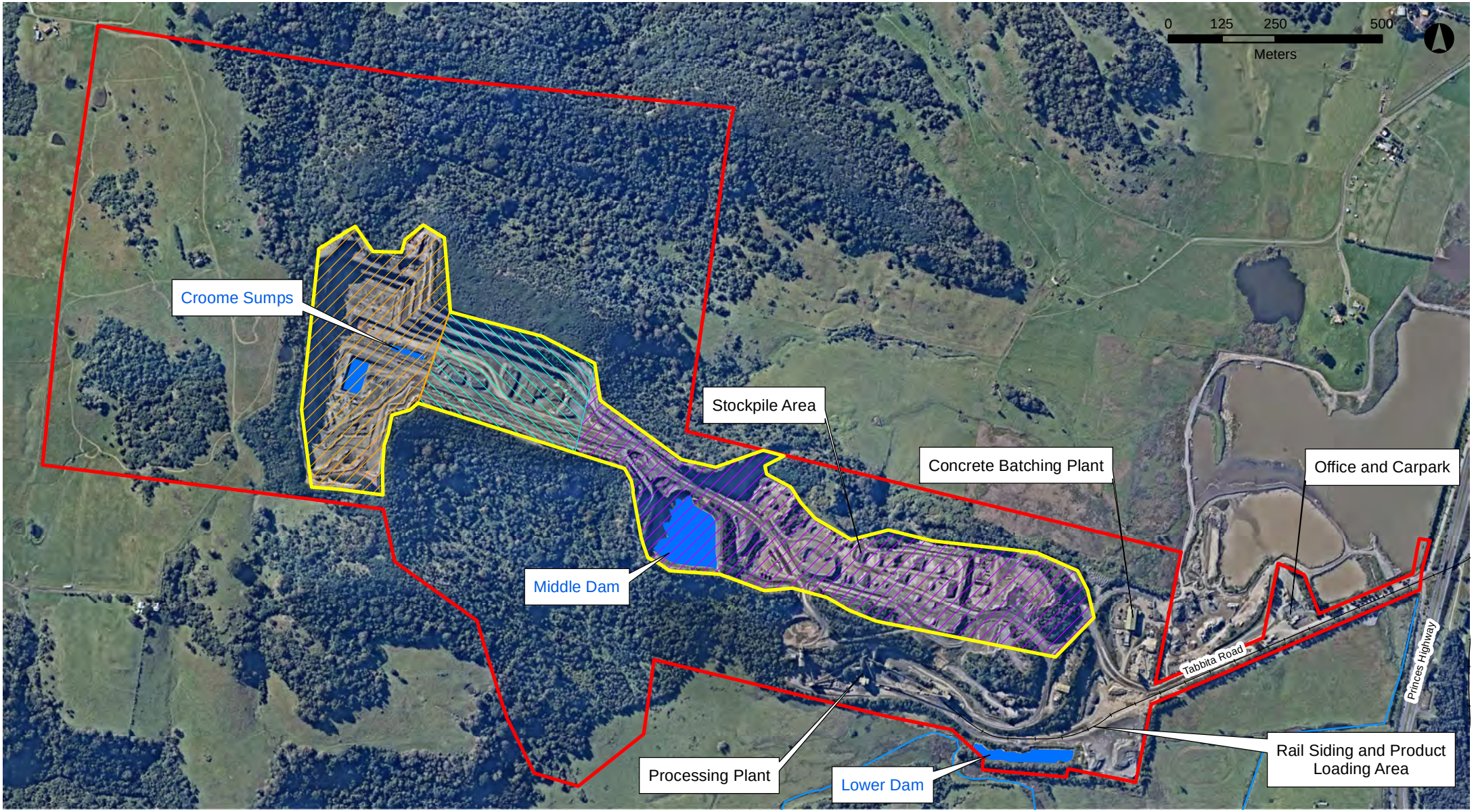
The western area, referred to as Croome Farm Pit extraction area, is owned by Boral. Extraction and commenced extraction in this area in 2000. Approximately 12Mt remains in the Croome Farm Pit extraction area. The resource within the Croome Farm Pit extraction area is calculated to the current approved depth of extraction of 107mAHD.

Extraction within Croome Farm Pit will continue to target the upper and middle latite flows. The design of the approved extraction area provides for the creation of three benches in the upper and middle flows in the Croome Farm Pit extraction area. Development Consent No. 168/1994 (am 1) allows an extraction rate of 750 000tpa (Corkery & Co 2003).

Rail Infrastructure Corporation (RIC) Slot

The central extraction area, referred to as RIC Slot extraction area, is located on land leased to Boral for which a production royalty is applied to any material extracted from this area. Extraction within this area commenced in 1986 with the intent to provide an internal low-level access to the Croome Farm Pit extraction area. Extraction within RIC Slot land will continue to target the upper and middle latite flows, with approximately 5 Mt remaining in the RIC Slot extraction area. Development Consent No. 161/1986 allows an extraction rate of 450 000tpa.

The extraction floor levels within the RIC Slot extraction area rise gradually in a westerly direction at about 3% to 4% to meet the horizontal floor (and bench) levels in the Croome Farm Pit extraction area. The extraction faces in the RIC Slot extraction area are typically 15 to 17m high.



LEGEND

- Site Boundary
- Hard Rock Quarry

Extraction Areas

- Original Quarry
- Croome Farm Pit
- RIC Slot (Rail Corp)

- Dams
- Rocklow Creek
- Railway

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 5, 141 Walker St | North Sydney NSW 2060
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

ARCADIS

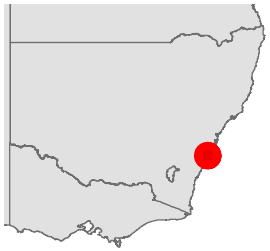


Figure 2 Dunmore Hard Rock Quarry Site Layout (July 2016)

Date: 26/08/2016 Path: F:\AA009002\L-GIS\A_Current\B_Maps\AA009002_014_DHQ_SiteLayout_A4_v3.mxd
Created by : NS
QA by : RB

3.2 Land Use

The majority of land surrounding the site is owned by Boral and Holcim, another other quarry company. A number of rural properties also adjoin the site. Land use in the surrounding locality includes:

- Agricultural land to the north and south, dairying is the major current agricultural enterprise in the locality (DECCW 2011).
- Commercial and industrial development, including Dunmore Sand and Soil Quarry immediately to the east, and Holcim Australia's Albion Park Quarry to the north.
- Residential development, including Dunmore Lakes Estate to the south, Shell Cove and Shellharbour to the north-east.
- Infrastructure development, including the Princes Highway and the South Coast Rail Line to the east.
- SEPP wetland no.374a, located on the eastern side of the Princes Highway.

3.2.1 Topography

The site is located amongst the undulating topography of the lower slopes of the Illawarra escarpment, on two hills known locally as Locking Hill and Gooseberry Hill. The northern and southern boundaries of extraction activities align with the crests of steep slopes, which have been retained to reduce impacts on visual amenity into the site (Corkery & Co 2003).

The majority of the site has a maximum elevation of approximately 164mAHD, which gradually reduces via a series of quarried landforms to approximately 10mAHD at the eastern margin of the extraction and stockpiling area, and 2mAHD at the weighbridge and office complex (Corkery & Co 2003).

3.2.2 Hydrology

Drainage within the site is essentially subdivided into clean runoff from outside the extraction footprint and potentially sediment-laden runoff from within the extraction and infrastructure areas.

The catchment area for potentially sediment laden runoff for the site is defined by the area of disturbance, bund walls and topographic watershed lines. All dirty runoff from site components such as the product stockpile areas, workshop and maintenance area, processing area as well as the extraction area flows into one of three dams: the Croome Sumps, Middle Dam and Lower Dam. A bio-filtration swale is located down gradient of the Lower Dam to aid water quality management when discharging from the Lower Dam. An overview of these dams and the bio-filtration swale is provided in the Water Management Plan. All clean runoff from the site flows into the tributaries of Rocklow Creek which is predominantly dry for most of the year (R.W. Corkery and Co., 2003).

3.3 Current Overburden Estimates and Requirements

The principal materials available for rehabilitation of all three extraction areas are shown in Table 3 as well as the estimated total area of benches to be rehabilitated. The figures are based on the final landform design discussed in section 4.1.1 and shown in Figure 6.

Table 3 - Overburden available and required for rehabilitation

Area	Overburden Available for Rehabilitation	Recoverable Soil	Estimated Bench Length	Bench Rehabilitation Overburden Requirement
Original Quarry			4.3 km	20 000 m^3
RailCorp Quarry Area	8 960 m^3	4 200 m^3	1.5 km	8 000 m^3
Croome Farm Pit Quarry Area	110 000 m^3	10 000 m^3	6 km	30 000 m^3
Croome Farm Pit Quarry Extraction Floor				20 000 m^3
Whole Site (Total)	**118 960 m^3**	**14 200 m^3**	**11.8 km**	**78 000 m**

3.4 Recent Rehabilitation Management

Most areas of the site are currently operational and as such rehabilitation is not able to commence on the majority of extraction areas until the completion of extraction activities. Progressive rehabilitation is, however, able to be carried out on areas such as final benches within the extraction areas and any disturbed areas beyond the final area of development limits. The progressive rehabilitation of the site has been undertaken in conjunction with on-going quarrying works. The rehabilitation works implemented aim to minimise risks to safely, stabilise the landform, minimise impacts upon water quality, maintain the land function capability and, where possible, create an environment comparable to the surrounding land to progressively meet the closure objectives for the site.

Rehabilitation activities undertaken to date have been in accordance with the Flora and Fauna Management and Rehabilitation Plan prepared by Cumberland Ecology (2009). Current locations of extraction include Croome Farm Pit South and Croome Farm Pit North. Concurrently, rehabilitation works have begun along the western wall of the Original Quarry and illustrated in Figure 3 as ‘Active rehabilitation’. Rehabilitation of the Site undertaken to date is limited to the Original Quarry. Landform construction on the western wall, adjacent the Middle Dam, is complete and soil placement will commence when available.

4 MANAGEMENT ACTIONS

4.1 Rehabilitation Management Objectives & Performance Criteria

The aim of the rehabilitation plan is to progressively encourage a sustainable vegetative cover in accordance with the rehabilitation objectives for the site as outlined in Table 4. Progressive rehabilitation work will be undertaken when reshaped, benched and topsoiled areas become available. Only small areas can currently be rehabilitated to avoid conflict with future extraction and sterilisation of resource production potential. Figure 3 - Figure 5 provide an indication of progressive rehabilitation during operations from short-term, medium and long-term measures. Figure 6 shows the proposed final rehabilitation following closure of the quarry. Specific objectives associated with rehabilitation of the DHQ including the relative performance criteria are provided in Table 4. The performance criteria will be used to assess the progress of the rehabilitation management actions.

Table 4 - Rehabilitation objectives and performance criteria

Time Period	Objective	Performance Criteria
Short term (< 5 years)	Minimise the environmental impact of the operation during the development and operational phases, ensuring that protection of water quality and erosion control works are key priorities, and to ensure progressive rehabilitation is completed as soon as practicable	Compliance with EPL, WMP and RMP
	Minimise visual impact of the operation during the operational phase as well as post-quarrying	Ensure visual impact controls outlined in 1994 EIS (Sinclair Knight Merz 1994) are maintained
	Ensure that site drainage and sedimentation structures remain stable and functional	Minimal rilling, erosion, sediment deposition in drains and water retention basins
	Ensure that vegetative matter and topsoil is made available for the site rehabilitation as required	Seed and plant material required for propagation removed and appropriately stored Native vegetation topsoil stripped and stockpiled in accordance with EIS (Corkery & Co. 2002)
	Guarantee that the resource is extracted and the site rehabilitated in a manner that will ensure the quality of surface runoff at all times	No uncontrolled surface runoff or soil erosion that is unstable, degrading and/or comprises end land use objectives
Medium term (6-10 years)	Ongoing progressive rehabilitation of the benches of the quarry pit as permitted	As above
	Maintenance of established rehabilitation areas i.e. vegetation and drainage works	Vegetation established and rehabilitated areas stable Areas free of significant weed or feral animal problems
Long term	Produce a final “walk away” landform that is geotechnically safe and stable that blends aesthetically into the surrounding landforms, yet as far as possible does not limit possible future land uses	Removal of infrastructure associated with mine related activities Safe and stable rehabilitation of final voids

Time Period	Objective	Performance Criteria
		Landform design is integrated with existing landscape to provide visual continuity

4.1.1 Final Landform

At the completion of extraction, the proposed final landform of the Project Site would comprise of a series of elongate benches, sloping extraction floors and potentially an area of the Original Quarry backfilled with breccia-conglomerate.

Once operations have ceased, all building and infrastructure will be removed from the site. These areas will be reshaped where necessary for topsoiling and revegetation. The quarry floor will be vegetated with appropriate native species in accordance with the FFMP (Arcadis 2016).

LEGEND

- Hard Rock Quarry
- Extraction Bench Rehabilitation
- Active Rehabilitation Area
- Short-term Rehabilitation (<5 years)
- No rehabilitation proposed (potential future extraction of Croome Farm West)
- RIC Slot

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 5, 141 Walker St | North Sydney NSW 2060
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

ARCADIS

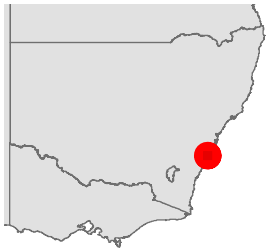
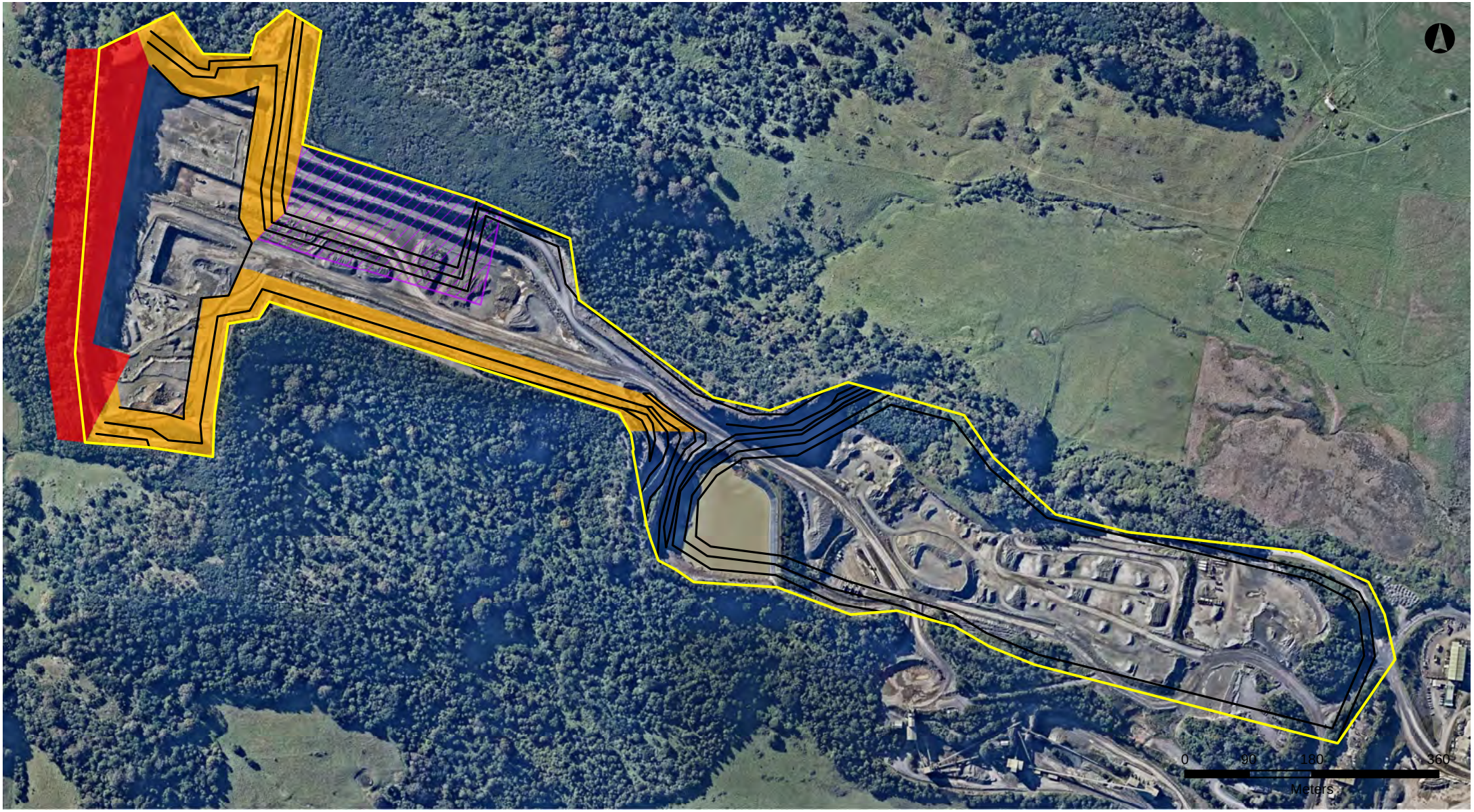


Figure 3 Short-term Rehabilitation (<5 years)

Date: 26/08/2016 Path: F:\AA009002\L-GIS\A_Current\B_Maps\AA009002_021_DHQ_Short_term_Rehab_A4_v1.mxd
Created by : NS
QA by : RB



LEGEND

- Hard Rock Quarry
- Extraction Bench Rehabilitation
- Medium-term Rehabilitation (5-10 years)
- No rehabilitation proposed (potential future extraction of Croome Farm West)
- RIC Slot

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 5, 141 Walker St | North Sydney NSW 2060
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

ARCADIS

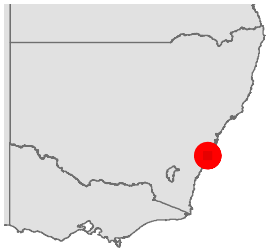
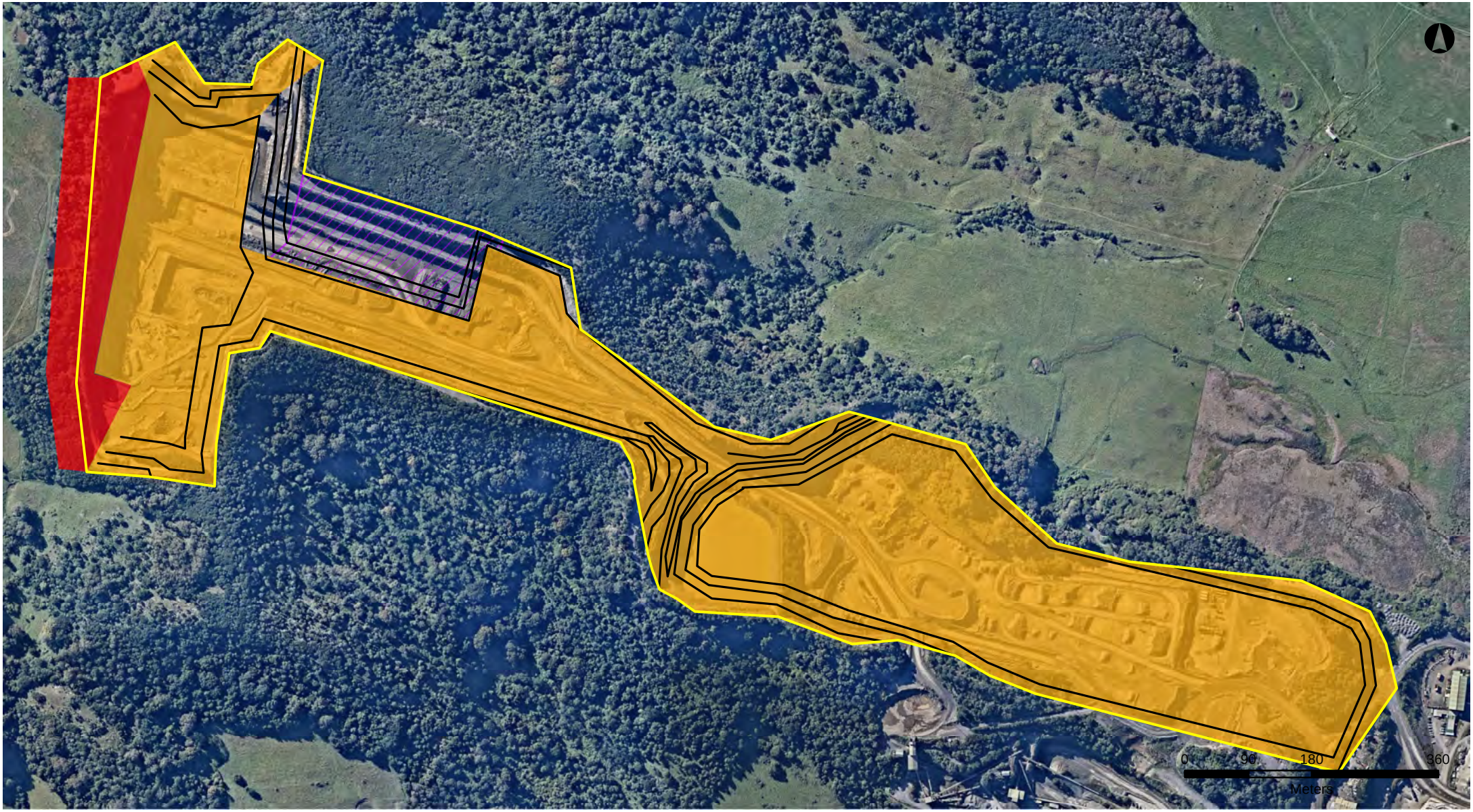


Figure 4 Medium-term Rehabilitation (5-10 years)

Date: 26/08/2016 Path: F:\AA009002\L-GIS\A_Current\B_Maps\AA009002_022_DHQ_Medium_term_Rehab_A4_v1.mxd
Created by : NS
QA by : RB



LEGEND

- Hard Rock Quarry
- Extraction Bench Rehabilitation
- No rehabilitation proposed (potential future extraction of Croome Farm West)
- Medium to Long-term Rehabilitation (10+ years)
- RIC Slot

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 5, 141 Walker St | North Sydney NSW 2060
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

ARCADIS

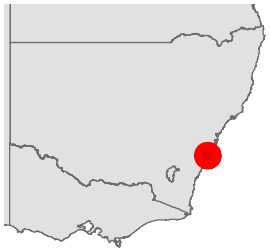
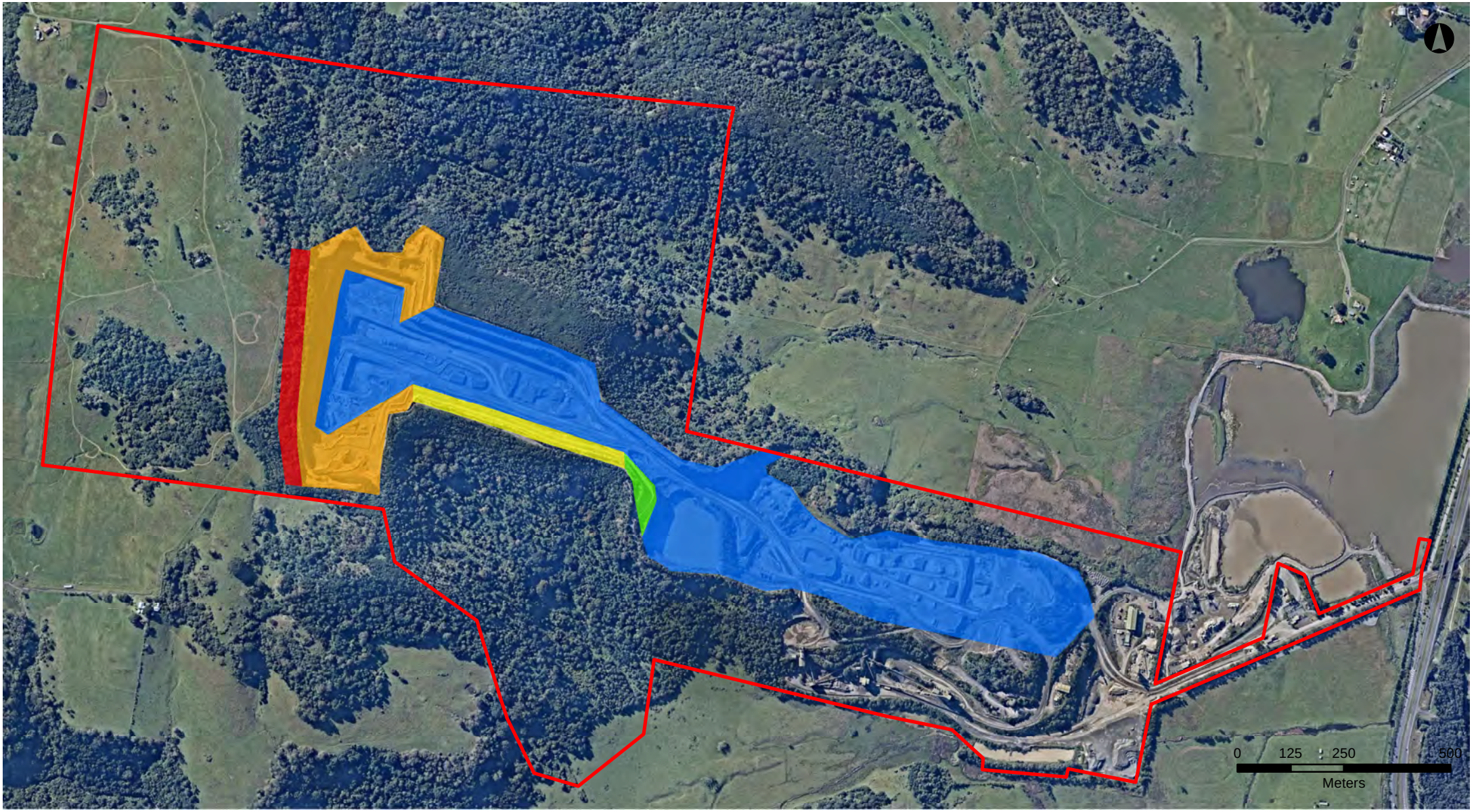


Figure 5 Medium to Long-term Rehabilitation (10+ years)

Date: 26/08/2016 Path: F:\AA009002\L-GIS\A_Current\B_Maps\AA009002_023_DHQ_Long_term_Rehab_A4_v1.mxd
Created by : NS
QA by : RB



LEGEND

Site Boundary

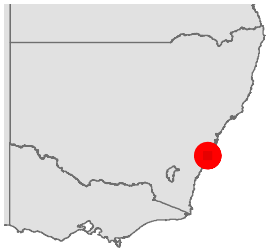
Rehabilitation

- Active Rehabilitation Area
- Short-term Rehabilitation (>5 years)
- Medium-term Rehabilitation (5-10 years)
- Medium to Long-term Rehabilitation (5-10+ years)
- No rehabilitation proposed (potential future extraction of Croome Farm West)

Figure 6 Final Landform (June 2016)

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 5, 141 Walker St | North Sydney NSW 2060
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

ARCADIS



Date: 20/06/2016 Path: F:\AA009002\L-GIS\A_Current\B_Maps\AA009002_019_DHQ_FinalLandform_A4_v1.mxd
Created by : NS
QA by : RB

4.2 Quarry Rehabilitation Procedures

The ongoing rehabilitation strategy for the quarry is to be an opportunistic progressive approach. Progressive rehabilitation will be undertaken, where possible, throughout the life of the quarry with a focus on rehabilitation of the out-of-pit emplacement areas. Rehabilitation on the majority of the extraction areas will not take place until the completion of extraction activities. Rehabilitation would be progressively undertaken, where practical, on areas such as final benches within the extraction areas and any disturbed areas beyond the final extraction area or development limits. Details of the proposed rehabilitation works during the operation of the quarry including a conceptual decommissioning plan are below. This approach will allow for rehabilitation to occur alongside excavation activities, resulting in vegetation being established in different areas of the site as areas become available following completion of excavation under the provision that these areas will not sterilise future production.

4.2.1 Topsoil Management

The EIS (R.W. Corkery & Co. 2005) identified that the natural soils within the remaining areas to be disturbed are confined solely to the Croome Farm Pit extraction area and of this, only 10 000m^3 of topsoil is suitable for recovery. To ensure there are negligible impacts on the soil resources within the DHQ, the following topsoil management controls should be applied:

- Topsoil is to be carefully stripped in order to recover the seed-bearing and organic component without diluting the topsoil with subsoil.
- All stripped topsoil is to be stored onsite and relocated when appropriate.
- Soil stockpiles are typically less than 1.5m high and allowed to regenerate naturally to limit erosion and generation of sediment-laden runoff.
- Reliance would be placed upon the natural regeneration for the growth of stabilising vegetation.

4.2.2 Erosion and Sediment Control

Sediment and erosion control measures will be implemented where necessary in accordance with the Water Management Plan (Arcadis 2016) until rehabilitation is complete.

4.2.3 Weed, Vermin and Feral Animal Control

Weed, vermin and feral animal control measures will be implemented in accordance with the FFMP (Arcadis 2016) until rehabilitation is complete.

4.2.4 Quarry Pit Rehabilitation

Original Quarry

The main features of the final landform in the Original Quarry would include the following:

- A sloping floor covering approximately 13ha with elevations ranging from 25mAHD on the western end to approximately -20mAHD on the eastern end.
- Two to three sloping benches (5m to 10m in width) generally parallel to the sloping floor. Access ramps to these benches will be left at strategic locations within the area.
- An entry point would be created along the southern boundary of the area to provide long term access onto the final floor.

All final benches would be rehabilitated through the placement of overburden and any available soil on the benches and revegetated in accordance with the FFMP (Arcadis 2016). The overburden would be randomly deposited on the benches in a manner that encourages the retention of rainfall and seepage. The extent of overburden placement on the floor of the Dunmore Quarry would be contingent to the ongoing land use within the area.

RIC Slot Quarry Area

At the completion of extraction, the southern extraction faces will be left as terminal faces rehabilitated in the same manner as described above for the Original Quarry. The northern extraction faces will not be rehabilitated as it is RIC's intention to develop its own quarry northwards. An access would be maintained through the floor of the RIC Slot extraction area between Croome Farm Pit extraction area and the Original Quarry for the life of the agreement between Boral and RIC.

Croome Farm Pit Quarry Area

At the completion of extraction, it is envisaged that the floor of the Croome Farm Pit Quarry area would be covered with a thin veneer of overburden and revegetated in accordance with the tree and shrub species specified in the FFMP (Arcadis 2016). This, however, would be verified once a final land use is identified.

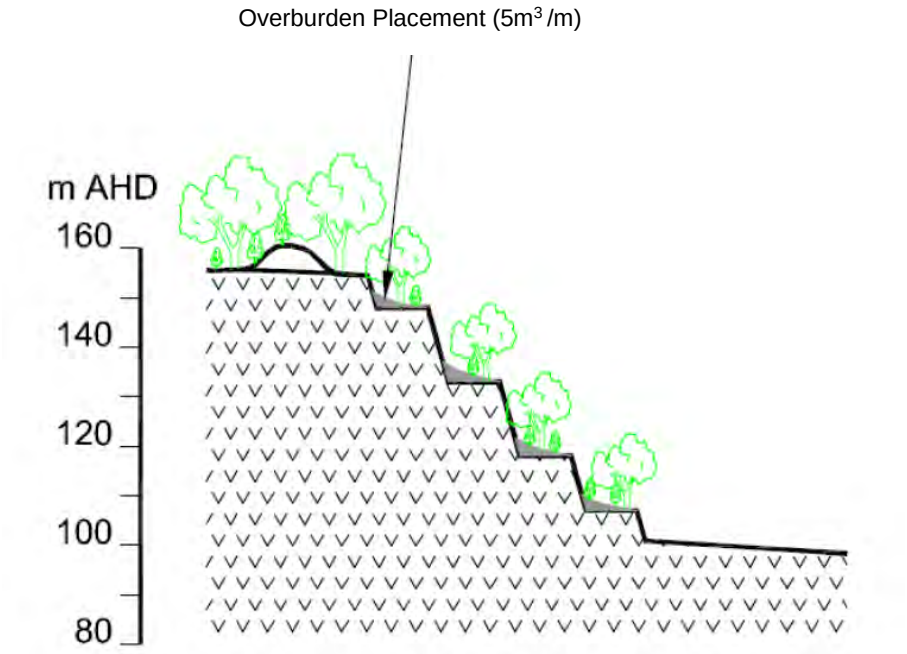


Figure 7 – Cross Section of Extraction Bench Rehabilitation

4.3 Safety

At quarry closure, one of the main priorities for the void will be to render it safe in terms of access by humans, livestock and wildlife. The following will be considered at the time of closure to ensure that the void is left in a safe manner. These include:

- All high walls are to be left geotechnically stable.
- A barrier at a safe distance from the perimeter of the void to prevent human access will be constructed. This is to provide an engineered barrier between the pit and the surrounding area.
- Suitable signs, clearly stating the risk to public safety and prohibiting public access will be erected at 50 m intervals outside the safety fence.
- Surface runoff from land surrounding the void will be diverted from entering the void so as to prevent the instability of the walls.

4.4 Conceptual Quarry Closure and Decommissioning Plan

Decommissioning of the processing plant is not envisaged at the completion of the extraction process as it is likely that other hard rock resources would be processed at the plant. The following sections summarise the key aspects related to decommissioning and closure of the site, infrastructure, plant and

buildings when all hard rock resources have been exhausted. It assumes that all buildings and other infrastructure are demolished and removed from the site despite the potential for them being used after quarrying (subject to the landholders requirements). It is considered likely that at least some aspects of the existing infrastructure will be used post quarrying, however they are not able to be identified at this time.

4.4.1 Decommissioning of Plant and Equipment

All surface infrastructure including the office buildings, workshops, parking areas, crushing, screening and wash plants, and product storage areas will be demolished and removed, and the areas containing this infrastructure recontoured. The access road will also be removed. Where possible, assets may be transferred or sold to other operations. The reshaped areas will then be topsoiled and seeded in accordance with a native tree and grass species mix to establish woodland vegetation.

Any remaining items will be demolished, removed and transported from the site as required. All recoverable scrap steel will be sold and recycled, with the remaining non-recycable wastes being taken to a licenced landfill. Prior to disposal, all wastes will be assessed in accordance with *Waste Classification Guidelines (DECC, 2008).*

All remaining areas will then be reshaped, topsoiled and seeded with a native tree and grass species mix to establish woodland vegetation.

All haul roads will also be removed and water management controls either removed or modified to assist in stabilisation of the final landform and to capture any sediment runoff from the rehabilitated areas.

4.4.2 Closure Methodology – Earthworks and Rehabilitation

Dams

There are three dams on site which collect sediment laden run-off: the Croome Sumps, Middle Dam and Lower Dam (illustrated in Figure 2). Special consideration should be given to the three dams when it comes time to design of the final land use of the quarry. Opportunities to retain the dams would be investigated closer to development of the final landform. There is potential that they could provide an ongoing erosion control, water management and/or ecological function for the site.

Consideration should be given to the ongoing lifespan of the dams if any are to be retained. Any of the dams that are not being retained onsite would be removed and the original drainage paths re-established where possible.

Quarry Void

With the completion of quarrying, the benches within the pit will remain. They will be spread with top dressing material and native tree and shrub species will be sown directly into these areas. The main aim will be to ensure that the pit is left geotechnically stable.

At quarry closure, the final bench will be shaped and the pit floor re-profiled and revegetated in line with the final land use.

5 SUMMARY OF MANAGEMENT ACTIONS

The objective of the final landform conceptual design is to cost effectively develop a sustainable, self-sustaining post quarry land use that effectively manages any potential adverse environmental impacts.

The final landform of the proposed quarry areas as set out in Figure 6 can only be considered conceptual as local variation in material may vary the final benching and batter design.

The floor of the DHQ extraction area comprising the Dunmore Original Quarry, Croome and RIC Slot extraction areas will be required for ongoing processing and stockpiling and as such will not be available for rehabilitation until the conclusion of excavation activities. The proposed Croome West Extraction area, if approved, will prevent rehabilitation of this area for at least 25 years based on the estimated available resource. For the purpose of this plan rehabilitation is proposed for the quarry floor for the long term but this would require re-evaluation under a scenario where the Croome West expansion modification is approved.

It is anticipated that rehabilitation of the final landform in which:

- The quarry floors and terminal faces will be rehabilitated and revegetated.
- All quarry face batters are anticipated to be between grades of 1:1 or 1:2 or with vertical face heights of approximately 10-20 metres and benches that are up to approximately 5-10 metres wide.
- The extraction and operational floor and benches will be returned to native vegetation following cessation of quarrying activities.

The management actions for the RMP are summarise in Table 5.

Table 5 - Summary of Management Actions

Site Section	Management Action Ref ID	Environmental Management Measure	Indicative Timeframe	Responsibility	Source
Progressive Rehabilitation – Whole Site					
Whole Site	DHQ-RMP	Undertake progressive rehabilitation in areas no longer required for extraction or access, focusing on rehabilitation of the out-of-pit emplacement areas	Ongoing	Site Manager or Delegate	Sch 4 Co. 53
Whole Site	DHQ-RMP-	Undertake extraction in compliance with extraction boundaries to prevent encroachment onto existing vegetation	Ongoing	Site Manager or Delegate	EIS
Whole Site	DHQ-RMP-	Store all stripped topsoil within the Original Quarry in the designated stockpile area and relocate when appropriate	Ongoing	Site Manager or Delegate	EIS
Whole Site	DHQ-RMP-	Soil stockpiles are to be a maximum of 1.5m in height in loose unconsolidated mounds and allowed to regenerate naturally to limit erosion and generation of sediment-laden runoff	Ongoing	Site Manager or Delegate	Sch. 4 Co. 24 and 42/EIS
Whole Site	DHQ-RMP-	Undertake all weed control in accordance with FFMP	Ongoing	Site Manager or Delegate	Sch. 4 Co. 48
Whole Site	DHQ-RMP-	Undertake all sediment and erosion control management actions in accordance with the Sediment and Erosion Control Plan found in the DHQ Water Management Plan.	Ongoing	Site Manager or Delegate	Sch. 4 Co. 42/EIS

Site Section	Management Action Ref ID	Environmental Management Measure	Indicative Timeframe	Responsibility	Source
Short Term (< 5 years)					
Dunmore Original Quarry	DHQ-RMP-	Develop native seed blend to achieve revegetation goals for southern benches shown in Figure 3.	1-3 years	Site Manager or Delegate	EIS
Dunmore Original Quarry	DHQ-RMP-	The southern benches located between the Middle Dam and Croome Farm Pit extraction area will be rehabilitated through the placement of soil on the benches and revegetated. Placement methods that account for safety and effectiveness of vegetation establishment will be considered prior to commencement on account of the narrow benches and access limitations. For example, application of “eco-blanket” using a blower truck.	1-3 years	Site Manager or Delegate	EIS
Dunmore Original Quarry	DHQ-16	Establish drainage diversion works on benches (where practical) to minimise erosion hazards and avoid runoff of top soil.	1-3 years	Site Manager or Delegate	EIS
Dunmore Original Quarry	DHQ-RMP-	Access through the floor of the extraction area between the Croome Farm Pit extraction area and Original Quarry is to be maintained for the life of the agreement between Boral and RailCorp	Ongoing	Site Manager or Delegate	Good Practice
Croome Farm Pit Extraction Area	DHQ-RMP-	Rip northern and southern benches in Croome Farm Pit Extraction Areas prior to the application of fertile topsoil.	1-3 years	Site Manager or Delegate	EIS

Site Section	Management Action Ref ID	Environmental Management Measure	Indicative Timeframe	Responsibility	Source
Croome Farm Pit Extraction Area	DHQ-RMP-	Develop native seed blend to achieve revegetation goals for northern and southern benches and apply via direct seeding method.	1-3 years	Site Manager or Delegate	EIS
Croome Farm Pit Extraction Area	DHQ-RMP-	Establish drainage diversion works on benches (where practical) to minimise erosion hazards and avoid runoff of top soil.	1-3 years	Site Manager or Delegate	EIS
Long Term (>10 years)					
Whole Site	DHQ-RMP-	All areas will be rehabilitated to provide compatibility with a variety of future long term uses of the site	> 10 years	Site Manager or Delegate	EIS
Whole Site	DHQ-RMP-	All surface infrastructure including the office buildings, workshops, parking areas, crushing, screening and wash plants, and product storage areas will be demolished (in accordance with *AS 2601-2001: The Demolition Structures)* and removed, and the areas containing this infrastructure recontoured.	> 10 years	Site Manager or Delegate	Sch 3 Co.10
Whole Site	DHQ-RMP-	All recoverable scrap steel will be sold and recycled, with the remaining non-recyclable wastes being taken to a licenced landfill. Prior to disposal, all wastes will be assessed in accordance with *Waste Classification Guidelines (DECC, 2008).*	> 10 years	Site Manager or Delegate	Sch 4 Co. 70

Site Section	Management Action Ref ID	Environmental Management Measure	Indicative Timeframe	Responsibility	Source
Whole Site	DHQ-RMP-	All remaining areas will then be reshaped, topsoiled and seeded with a native tree and grass species mix to establish woodland vegetation.	> 10 years	Site Manager or Delegate	Good Practice
Whole Site	DHQ-RMP-	All haul roads will also be removed and water management controls either removed or modified to assist in stabilisation of the final landform and to capture any sediment runoff from the rehabilitated areas.	> 10 years	Site Manager or Delegate	Good Practice
Monitoring, Reporting and Review					
Whole Site	DHQ-RMP-	Include a rehabilitation management program progress report in the Annual Review.	Annual	Environmental Manager	Sch 4 C 58
Whole Site	DHQ-RMP-	Complete an environmental incident report in the event a non-compliance is identified during monitoring	Ongoing	Environmental Manager	EPL 77 R2/R3
Whole Site	DHQ-RMP-	Undertake a review of the RMP: • every five years; • where an audit recommends a review; • where there are repeat non-conformances; and as otherwise determined by the Environmental Manager	Ongoing	Environmental Manager	CoA Sch 4 Co. 54
Whole Site	DHQ-RMP-	Review the adequacy of site-specific environmental safeguards and management measures on a weekly basis	Ongoing	Environmental Manager	Good Practice

Site Section	Management Action Ref ID	Environmental Management Measure	Indicative Timeframe	Responsibility	Source
Whole Site	DHQ-RMP-	All staff and subcontractors involved in the Project must complete environmental induction training. Further details on the subject matter is discussed in Section 8,	Ongoing	Environmental Manager	EIS
Whole Site	DHQ-RMP-	Where identified as necessary, additional site-specific training will be delivered to relevant personnel/contractors as required regarding sensitive environmental issues. Further detail on specific training is discussed in Section 8.	Ongoing	Environmental Manager	EIS
Whole Site	DHQ-RMP-	An environmental incidents register will be maintained and include any outcomes from incidents.	Ongoing	Environmental Manager	Good Practice
Whole Site	DHQ-RMP-	Develop an emergency incident plan to respond to uncontrolled discharges of fuels, oil and chemicals/unforeseen events. Further detail on incident reporting is discussed in Section 8.	Ongoing	Environmental Manager	Sch 4 Co. 75
Whole Site	DHQ-RMP-13	Contract a qualified rehabilitation and revegetation consultant to undertake rehabilitation activities.		Environmental Manager	Good Practice

6 FINANCING AND PROVISIONS

In accordance with CoA (3)57, Boral established a Bond in April 2006 in the form of a Bank Guarantee for the HRQ. The condition requires the lodgement of a rehabilitation and conversation bond however the DG has accepted the bank guarantee has an appropriate mechanism for security of the funds for possible default in rehabilitation by the company. The figure is calculated using the amount of disturbed area of land. Within three years of lodging the bond (or in this case the bank guarantee), and every five years thereafter, Boral must review and if necessary revise the sum. The review takes into consideration the effects of inflation, changes to area of disturbance, and the performance of the compensatory habitat proposal.

7 MONITORING, REPORTING AND REVIEW

7.1 Monitoring

This RMP will be reviewed periodically by suitably qualified persons to determine the efficacy of the Plan and ensure it continues to fulfil its intended purpose. This will allow for and promote adaptive management through progressive rehabilitation.

Rehabilitation management actions and environmental performance will be measured through regular environmental performance reviews. These will be based on the measurable outcomes identified in this management plan and key performance criteria outlined in Table 4. The reviews will be used to assess progress in meeting project rehabilitation objectives and performance criteria and will be undertaken by the Environmental manager:

- In response to new or revised Boral Project approvals.
- In response to major changes in site conditions or work methods.

Boral Project environmental performance is measured through compliance with the various environmental management plans including the OEMP/CEMP and sub-plans.

Should an environmental non-conformance be identified as a result of a monitoring result, a non-conformance report will be completed and archived by the Environmental manager.

7.2 Reporting

The Environmental manager is responsible for managing the environmental reporting program and arranging specialist consultants to prepare reports, as required.

7.2.1 Annual Review

The results of the rehabilitation monitoring program will be presented in the Annual Review (AR). This will include detailed assessment of monitoring results collected over the course of the annual monitoring program, an evaluation of any trends occurring across the site, any community/stakeholder complaints or non-conformances with licences/criteria and recommendations for management actions. Through the AR management actions may include:

- Refinement of rehabilitation management objectives and initiation of remedial action.
- Alteration to monitoring frequency, parameters or locations.

7.3 Review

7.3.1 Review of Monitoring Actions

Any non-compliance identified during monitoring actions, of management and mitigation measures, will be highlighted and an environmental incident report will be completed. The non-conformance will be considered unresolved until:

- The non-compliance issue has been resolved;
- A new or revised procedure has been established and implemented;
- Training has been provided to relevant personnel/ sub-contractors; or
- Additional specific environmental management inspections are detailed in this RMP

management plan.

7.3.2 Review of Management Plan

This Plan will be reviewed on the following basis:

- Every five years to ensure its continuing effectiveness.
- Where an audit recommends a review.
- Where there are repeat non-conformances and these are not closed out within the agreed timeframe.
- As otherwise determined by the Environmental manager.

A review of the adequacy of site-specific environmental safeguards and management measures will be carried out by the Environmental manager on a weekly basis. This review will encompass site inspection and auditing reports as well as root cause assessments undertaken for any incidents reported.

8 TRAINING

8.1 Environmental Induction

Environmental induction training will be delivered to all staff and subcontractors involved in the Project. This will be delivered by the relevant Boral personnel (e.g. Environmental Manager). This will include a component on environmental/what this Plan is for management and the associated controls and mitigation measures that will be implemented for the Project. All personnel will be required to sign an induction sheet, a copy of which will be maintained on site and appropriate records maintained.

Appropriate training and induction should include, but not be limited to:

- Raising awareness of on-site environmental management issues;
- Providing information on the location and importance of EECs, threatened fauna species (and habitat) known to occur within the site;
- Providing information on the boundaries for any proposed vegetation clearing;
- Training on procedures on encountering fauna (e.g snakes); and
- Training on weed identification and the appropriate guidelines for removing weeds, driving vehicles in weed infested locations and the disposal of weed infested topsoil.

8.2 Site-Specific Environmental Training

Where identified by the Environmental manager, additional site-specific training may be developed and implemented by the Project manager, delivered to relevant personnel/contractors as required regarding sensitive environmental issues. Specific training may include:

- Training in the use and location of spill kits.
- Management, and environmental incident response training.

8.3 Environmental Incidents Register

An environmental incidents register will be maintained by the Environmental manager and will include any outcomes from incidents. These will feed into the inductions, toolbox meetings and pre-start meetings as necessary and appropriate.

9 REFERENCES

Boral Resources (NSW) Pty Ltd (2016) *Project Management Plan– Rehabilitation on Southern RIC Wall*.

Boral Resources (NSW) Pty Ltd (2015) *Croome Reserve Remaining Dunmore Quarry*

Cumberland Ecology (2009) *Dunmore Quarry Production Increase – Vegetation Offset Strategy (Development Consent Conditions 46-58) Flora and Fauna Management and Rehabilitation Plan 2009 Revision*, Cumberland Ecology, Carlingord (NSW).

DECC (2008) *Waste Classification Guidelines.*

Environmental Sustainability Unit – Mineral Resources (2013), *ESG3: Mining Operations Plan (MOP) Guidelines,* NSW Department of Trade and Investment, Maitland (NSW)

R.W. Corkery and Co Pty Ltd (2003) *Environmental Impact Statement for the proposed Dunmore Quarry Production Increase.* Corkery and Co Pty Ltd, Orange (NSW).

APPENDIX A DEVELOPMENT CONSENT

Development Consent

Section 80 of the *Environmental Planning & Assessment Act 1979*

I, the Minister Assisting the Minister for Infrastructure and Planning (Planning Administration), approve the Development Application referred to in Schedule 1, subject to the conditions in Schedules 3 to 5.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the on-going environmental management of the development.

This instrument includes changes made by Modification 1 in December 2005 (marked in blue)
This instrument includes changes made by Modification 2 in June 2006 (marked in red)
This instrument includes changes made by Modification 3 in May 2008 (marked in green)
This instrument includes changes made by Modifications 4 and 5 in November 2008 (marked in pink)
Modification 6 (January 2014) marked in purple
Modification 7 (October 2015) marked in maroon

Diane Beamer, MP
Minister Assisting the Minister for Infrastructure and Planning (Planning Administration)

Sydney 2004 File No. S03/01960

SCHEDULE 1

Development Application:	DA 470-11-2003.
Applicant:	Boral Resources (NSW) Pty Limited (ABN: 51 000 756 507).
Consent Authority:	Minister Assisting the Minister for Infrastructure and Planning (Planning Administration).
Land:	See Appendix 1.
Proposed Development:	Increase production at the Dunmore Quarry from 1.2 million tonnes per annum (Mtpa) to 2.5 Mtpa, by: • increasing operating hours; • making minor changes to equipment types and configuration, mainly within the crushing and conveying circuit; and • increasing rail and road transportation of product.
State Significant Development:	The proposal is classified as State significant development, under section 76A(7) of the *Environmental Planning and Assessment Act 1979*, because it is an extractive industry where the proposed rate of production exceeds the threshold limits specified in the Ministerial declaration, dated 3 August 1999.
Integrated Development:	The proposal is classified as integrated development, under section 91 of the *Environmental Planning and*

	Assessment Act 1979, because it requires additional approvals under the: • *Protection of the Environment Operations Act 1997;* • *National Parks & Wildlife Act 1974;* • *Rivers and Foreshores Improvement Act 1948.*
Designated Development:	The proposal is classified as designated development, under section 77A of the *Environmental Planning & Assessment Act 1979*, because it is for an extractive industry that would "obtain or process for sale, or reuse, more than 30,000 cubic metres of extractive material per year…". Consequently, it meets the criteria for designated development in schedule 3 of the *Environmental Planning & Assessment Regulation 2000*.

Note:

- *To find out when this development consent becomes effective, see Section 83 of the Environmental Planning and Assessment Act 1979* (EP&A Act);
- *To find out when this development consent is liable to lapse, see Section 95 of the EP&A Act; and*
- *To find out about appeal rights, see Section 97 of the EP&A Act.*

SCHEDULE 2
DEFINITIONS

Annual Review	Annual Review, as required under condition 5 of schedule 5
Applicant	Boral Resources (NSW) Pty Limited
BCA	Building Code of Australia
CCC	Community Consultative Committee
Council	Shellharbour City Council
DA	Development Application
Day	Day is defined as the period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Department	Department of Planning and Environment
DPI – Water	Department of Primary Industries – Water
DRE	Division of Resources and Energy
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPA	Environment Protection Authority
EPL	An Environment Protection Licence applying to the development, issued by the EPA
Evening	Evening is defined as the period from 6pm to 10pm
Feasible	Feasible relates to engineering considerations and what is practical to build or carry out
GTA	General Term of Approval
Incident	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this consent
Land	Land means the whole of a lot in a current plan registered at the Land Titles Office at the date of this development consent
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
Minister	Minister for Planning, or delegate
Night	Night is defined as the period from 10pm to 6am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
OEH	Office of Environment and Heritage
Privately-owned land	Land not owned by the Applicant or its related companies or where a private agreement does not exist between the Applicant and the land owner
Quarrying operations	Includes the removal of overburden and extraction, processing, handling, storage and transportation of extractive material on the site
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
RMS	Roads and Maritime Services
Secretary	Secretary of the Department, or nominee
SEE	Statement of Environmental Effects
Shoulder	Time interval from 6am to 7am, Monday to Saturday
Site	Land to which the DA applies

TABLE OF CONTENTS

SCHEDULE 3
ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Applicant shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.

Terms of Approval

2. The Applicant shall carry out the development generally in accordance with the:
   (a) DA 470-11-2003;
   (b) EIS titled *Environmental Impact Statement for the proposed Dunmore Quarry Production Increase*, Volumes 1 & 2, dated November 2003, and prepared by R. W. Corkery & Company Pty Limited
   (c) The letter from Boral Quarries to the Department dated 20 October 2005 about the application to modify Dunmore Quarry development consent DA 470-11-2003, and accompanying plans 4034032_01 issue E, and 4034032_EL issue B;
   (d) modification application MOD 59-4-2006 and letter from Boral Quarries to the Department dated 13 April 2006;
   (e) Modification Application 470-11-2003 Mod 3, letter to the Department dated 28 March 2008, and accompanying plans GE-DU-2961-02 Rev D; GE-DU-2962-01 Rev B; GE-DU-2963-01 Rev 0; and GE-DU-2964-02 Rev 0; and
   (f) Modification Application 470-11-2003 Mod 4 and accompanying SEE titled *Statement of Environmental Effects for the proposed Dunmore Hard Rock Quarry Extension,* dated May 2008, and letter from Boral Quarries & Recycling to the Department dated 22 September 2008;
   (g) Modification Application 470-11-2003 Mod 5 and accompanying letter from Boral Quarries & Recycling to the Department dated 16 September 2008 (and accompanying plan GE-DU-2966-01 Rev E);
   (h) Modification Application 470-11-2003 Mod 6 and accompanying document titled *Environmental Assessment Dunmore Hard Rock Quarry– Modification 6,* prepared by EMGA Mitchell McLennan and dated 19 November 2012;
   (i) Modification Application 470-11-2003 Mod 7 and accompanying document titled *Proposed Blending Plant Dunmore Hardrock Quarry DA 470-11-2003 – Modification 7, Environmental Assessment*, dated December 2014; and
   (j) the conditions of this consent.

3. If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.

4. The Applicant shall comply with any reasonable requirement/s of the Secretary arising from the Department's assessment of:
   (a) any reports, strategies, plans, programs, reviews, audits or correspondence that are submitted in accordance with this consent; and
   (b) the implementation of any actions or measures contained in these documents.

Quarrying Operations

5. The Applicant may carry out quarrying operations on the site until 30 September 2034.

   Note: Under this consent, the Applicant is required to rehabilitate the site and carry out additional undertakings to the satisfaction of the Secretary. Consequently, this consent will continue to apply in all other respects other than the right to conduct quarrying operations until the rehabilitation of the site and those undertakings have been carried out to a satisfactory standard.

6. The Applicant shall not produce or transport more than 2.5 million tonnes of quarry products a calendar year from the development.

Transportation

7. The Applicant shall not transport, or permit to be transported, more than 1.5 million tonnes of quarry products from the site a calendar year by road, except in an emergency with the written approval of the Secretary.

7a. The Applicant shall maximise transport of quarry products from the site by rail, so far as is reasonable and feasible.

Surrender of Consents

8. Within 6 months of the date of this consent, the Applicant shall surrender all existing development consents and existing use rights associated with the site, in accordance with clause 97 of EP&A Regulation.

Structural Adequacy

9. The Applicant shall ensure that any new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

Notes:
- *Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for any building works.*
- *Part 8 of the EP&A Regulation sets out the detailed requirements for the certification of development*

Demolition

10. The Applicant shall ensure that all demolition work is carried out in accordance with *AS 2601-2001: The Demolition of Structures,* or its latest version.

Protection of Public Infrastructure

11. The Applicant shall:
    (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and
    (b) relocate, or pay the full costs associated with relocating any public infrastructure that needs to be relocated as a result of the development.

Operation of Plant and Equipment

12. The Applicant shall ensure that all plant and equipment at the site, or used in connection with the development, are:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

SCHEDULE 4
SPECIFIC ENVIRONMENTAL CONDITIONS

IDENTIFICATION OF BOUNDARIES

1. Within 6 months of the date of this consent and any subsequent modification involving a change to the approved limits of extraction, the Applicant shall:
   (a) engage a registered surveyor to mark out the boundaries of the approved limits of extraction;
   (b) submit a survey plan of these boundaries to the Secretary; and
   (c) ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits.

ACQUISITION UPON REQUEST

2. Upon receiving a written request for acquisition from the landowner of the land listed in Table 1, the Applicant shall acquire the land in accordance with conditions 3 and 4 below.

Land Owner(s)	Land Identification
Creagan	Lot 5 DP1001931
Stocker	Lot 1 DP745632
McParland/ Fogarty	Lot 10 DP977931
Fogarty/ McParland	Kimberly Property

Table 1: Land Subject to Acquisition on Request

3. Within 6 months of receiving a written request from the landowner, the Applicant shall pay the landowner:
   (a) the current market value of the landowner's interest in the land at the date of this written request, as if the land was unaffected by the development the subject of this DA, having regard to the:
      - existing and permissible use of the land, in accordance with the applicable environmental planning instruments at the date of the written request; and
      - presence of improvements on the land and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date; and
   (b) the reasonable costs associated with:
      - relocating within the Shellharbour or Kiama local government areas, or to any other local government area determined by the Secretary; and
      - obtaining legal and expert advice for determining the acquisition price of the land and the terms upon which it is to be acquired; and
   (c) reasonable compensation for any disturbance caused by the land acquisition process.

   However, if within 6 months of receiving this written request, the Applicant and landowner cannot agree on the acquisition price of the land and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Secretary for resolution.

   Upon receiving such a request, the Secretary shall request the NSW President of the Australian Property Institute to appoint a qualified independent valuer to consider submissions from both parties, and determine a fair and reasonable acquisition price for the land, and/or the terms upon which the land is to be acquired.

   If either party disputes the independent valuer's determination, the independent valuer must refer the matter back to the Secretary for resolution.

   If the landowner refuses to accept this offer within 6 months of the date of the Applicant's offer, the Applicant's obligations to acquire the land cease, unless otherwise agreed by the Secretary.

4. The Applicant shall bear the costs of any valuation or survey assessment requested by the independent valuer or the Secretary, and the costs of determination referred to in Condition 3 above.

5. If the Applicant and landowner agree that only part of the land should be acquired, then the Applicant shall pay all reasonable costs associated with obtaining Council approval for any plan of subdivision, and registration of the plan at the Office of the Registrar-General.

6. While the land listed in Table 1 is privately-owned land, the Applicant shall comply with the requirements applying to this land in these conditions of consent.

NOISE

Noise Limits

7. [1]The Applicant shall ensure that the noise generated by the development does not exceed the criteria specified in Table 2.

Receiver Locations	Noise Limits dB(A)					
	$L_{Aeq\ (15minute)}$				$L_{A1\ (1minute)}$	
	Day	Evening	Night	Shoulder	Night	Shoulder
Location A McParland Residence	35	35	35	35	45	45
Location K Stocker Residence	49	44	38	47	48	55
Location O Dunmore Lakes	49	44	38	47	48	55
Location J Creagan Residence	Negotiated Agreement in Place					

Table 2: Noise Impact Assessment Criteria for the Development

Notes:

1. *Receiver locations nominated in Appendix A Figure A2 of the report prepared by Richard Heggie Associates Report No.605/03 Titled Part 1: Noise Assessment – Dunmore Quarry Production Increase.*
2. *The above table may be varied if the Applicant enters into a negotiated agreement with any of the affected residents, or if existing agreements become void.*
3. *Noise from the development is to be measured at the most affected point on or within the residential boundary or at the most affected point within 30m of the dwelling (rural situations) where the dwelling is more than 30m from the boundary, to determine compliance with the $L_{Aeq(15\ minute)}$ noise limits in the above table. Where it can be demonstrated that direct measurement of noise from the development is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.*
4. *Noise from the development is to be measured at 1m from the dwelling façade to determine compliance with the $L_{A1(1minute)}$ noise limits in above table.*
5. *The noise emission limits identified in Table 1 apply under meteorological conditions of:*
   - *Wind speed up to 3m/s at 10 metres above ground level; or*
   - *Temperature inversion conditions of up to 3°C/100m and wind speed up to 2m/s at 10 metres above the ground.*

Noise Investigations

8. [2]Within 6 months of the date of this consent, the Applicant shall undertake noise investigations, which may include sound power levels emitted from plant at the site, to determine near-field trigger levels that would assist in demonstrating compliance and verify the effectiveness of noise mitigation works to the satisfaction of the EPA.

Note: The purpose of this condition is to capture the proposed noise verification program where near field monitoring will be undertaken for groups of plant detailed in Richard Heggie and Associates letter dated 2 March 2004.

[1] Incorporates EPA GTA
[2] Incorporates EPA GTA

Operating Hours

9. The Applicant shall comply with the operating hours in Table 3:

Activity	Days of the Week	Time
Extraction and Processing	Monday – Saturday	6-00am to 10-00pm
Product Transfer to Stockpiles	Monday - Saturday	6-00am – Midnight
Distribution	Monday – Saturday	24 hrs
	Sunday	See Condition 10, Schedule 4
Maintenance	Monday – Sunday	24 hrs

Table 3: Operating Hours for the Development

10. [3]The Applicant may only distribute quarry products off-site by road on up to 15 Sundays a year, between 8am and 6pm, unless the EPA approves otherwise. This restriction does not apply to distribution by rail, which is allowed 24 hours a day, 7 days a week.

Oversized Material

11. [4]The Applicant shall not process any oversized raw feed material at the development during the shoulder period.

Note: For the purpose of this condition "oversized raw feed material" is defined as where more than 50% of the shot is over 900mm in diameter.

Noise Monitoring

12. Deleted

13. [5]Within 3 months of the date of this consent, and annually thereafter, unless directed otherwise by the Secretary, the Applicant shall:
    (a) commission a suitably qualified person to assess whether the development is complying with the noise impact assessment criteria in Table 2, in general accordance with the NSW Industrial Noise Policy and Australian Standard (AS) 1055-1997: "Description and Measurement of Environmental Noise"; and
    (b) provide the results of this assessment to the EPA and Secretary within a month of commissioning the assessment.

14. Within 3 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Noise Monitoring Program for the development, in consultation with the EPA, and to the satisfaction of the Secretary.

Reporting

15. Deleted

BLASTING AND VIBRATION

Airblast Overpressure Criteria

16. The Applicant shall ensure that the airblast overpressure level from blasting at the development does not exceed the criteria in Table 4 at any residence or sensitive receiver on privately-owned land.

Airblast overpressure level [dB(Lin Peak)]	Allowable exceedance
115	5% of the total number of blasts over a period of 12 months
120	0%

Table 4: Airblast Overpressure Limits

[3] Incorporates EPA GTA
[4] Incorporates EPA GTA
[5] Incorporates EPA GTA

Ground Vibration Criteria

17. The Applicant shall ensure that the peak particle velocity from blasting at the development does not exceed the criteria in Table 5 at any residence or sensitive receiver on privately - owned land.

Peak particle velocity (mm/s)	Allowable exceedance
5	5% of the total number of blasts over a period of 12 months
10	0%

Table 5: Ground Vibration Limits

Blasting Restrictions

18. [6]Blasting operations at the site may only take place:
    a) between 9am and 5pm Monday to Saturday inclusive;
    b) are limited to 2 blasts each day; and
    c) at such other times as may be approved by EPA.

Public Notice

19. During the life of the development, the Applicant shall:
    (a) operate a blasting hotline, or alternative system agreed to by the Secretary, to enable the public to get up-to-date information on blasting operations at the development; and
    (b) notify landowners and other interested persons about this hotline or system by placing annual notices in a local newspaper.

Blast Management Plan

20. Before carrying out any development within 250 metres of Lot 10 DP977931 (see Figure 4.4 of the EIS), the Applicant shall prepare, and subsequently implement, a Blast Management Plan for the development in consultation with the landowner(s), and to the satisfaction of the Secretary. This plan must describe the measures that would be implemented to:
    (a) avoid and/or minimize any blasting impacts of the development on either the property, or use of the property;
    (b) monitor the blasting impacts of the development on the property;
    (c) mitigate, remediate or compensate for any blasting impacts of the development on either the property, or the use of the property.

Blast Monitoring

21. [7]The Applicant shall monitor the airblast overpressure and peak particle velocity impacts of the development at the permanent monitoring station at Croome Farm, or any alternative location approved by the EPA, to the satisfaction of the EPA and Secretary, using the specified units of measure, frequency, sampling method, and location in Table 6.

Parameter	Units of Measure	Frequency	Sampling Method	Measurement Location
Airblast overpressure	dB(Lin Peak)	During every blast	AS2187.2-1993[1]	Not less than 3.5m from a building or structure *(or as otherwise agreed by EPA)*

[6] Incorporates EPA GTA
[7] Incorporates EPA GTA

Peak particle velocity	mm/s	During every blast	AS2187.2-1993	Not more than 30m from a building or structure *(or as otherwise agreed by EPA)*

Table 6: Airblast overpressure and peak particle velocity monitoring

[1] *Standards Australia, 1993, AS2187.2-1993: Explosives - Storage, Transport and Use of Explosives*

AIR QUALITY

Impact Assessment Criteria

22. The Applicant shall ensure that the air pollution generated by the development does not cause exceedances of the ambient air quality standards and goals listed in Tables 7, 8, and 9 at any privately-owned land.

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	30 µg/m^3

Table 7: Long Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	50 µg/m^3

Table 8: Short Term Impact Assessment Criterion for Particulate Matter

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m^2/month	4 g/m^2/month

Table 9: Long Term Impact Assessment Criteria for Deposited Dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 2003, AS 3580.10.1-2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Management

23. [8]The Applicant shall minimise and/or prevent the emission of dust from the site.

24. Within 3 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Fines Management Plan to the satisfaction of the EPA. This plan must include the measures that would be implemented to stabilise the surface of stockpiles of fines to minimise wind-blown dust emissions and the erosion/product loss due to stormwater run-off.

Note: Fines are < 4mm in diameter.

Monitoring

25. [9]The Applicant shall monitor (by sampling and obtaining results by analysis) the concentration of each pollutant in Table 10 to the satisfaction of the EPA and the Secretary, using the specified unit of measure, averaging period, frequency, sampling method and minimum number of locations.

Pollutant	Unit of Measure	Averaging Period	Frequency	Sampling Method	Locations
Dust deposition	g/m2/month	Month, annual	Continuous	AM-15	4

[8] Incorporates EPA GTA
[9] Incorporates EPA GTA

PM_{10}	$\mu g/m^3$	24 hour, annual	Continuous	AM-18 (or equivalent)[1]	1

Table 10: Sampling of Air Pollutants

[1] *The Applicant may use an equivalent sampling method to AM-18, with the approval of EPA.*

26. Within 3 months of the date of this consent, the Applicant shall prepare, and subsequently implement, an Air Quality Monitoring Program for the development, in consultation with the EPA, and to the satisfaction of the Secretary.

METEOROLOGICAL MONITORING

27. The Applicant shall establish a permanent meteorological station at a location approved by the EPA, and to the satisfaction of the Secretary, to monitor the parameters specified in Table 11, using the specified units of measure, averaging period, frequency and sampling method.

Parameter	Units of measure	Averaging period	Frequency	Sampling method[1]
Rainfall	*mm/hr*	*1 hr*	*Continuous*	*AM-4*
Temperature @ 2 m	*K*	*1 hr*	*Continuous*	*AM-4*
Temperature @ 10 m	*K*	*1 hr*	*Continuous*	*AM-4*
Wind direction @ 10 m	*Compass points*	*1 hr*	*Continuous*	*AM-2*
Wind speed @ 10 m	*m/s*	*1 hr*	*Continuous*	*AM-2*
Siting	-	-	-	*AM-1*

Table 11: Meteorological Monitoring

[1] *NSW EPA, 2001, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.*

SURFACE AND GROUND WATER

Pollution of Waters

28. Except as may be expressly provided by an Environment Protection Licence, the Applicant shall comply with section 120 of the *Protection of the Environment Operations Act 1997* during the carrying out of the development.

Water Discharge Limit

29. Except as may be expressly provided by an Environmental Protection Licence, the Applicant shall ensure that the discharges from any licenced discharge point/s comply with the limit in Table 12:

Pollutant	Units of Measure	100 Percentile Concentration Limit
TSS	mg/L	50
pH	pH	6.5 – 8.5

Table 12: Water Discharge Pollution Limits

Site Water Balance

30. Each year, the Applicant shall:
(a) review the site water balance for the development against the predictions in the EIS;
(b) re-calculate the site water balance for the development; and
(c) report the results of this review in the Annual Review.

Storm Water Management System

31. The Applicant shall ensure that the storm water management system for the development is designed, constructed and operated to capture and treat polluted waters from storm event(s) of up to and including the 5-day, 95th percentile rainfall event.

32. The Applicant shall ensure that the basins in the storm water management system are managed in accordance with the operating principles within the revised Water Management

Plan prepared by Evans and Peck, dated April 2008, or any subsequent Water Management Plan approved by the Secretary, to maintain the required storm water storage volume.

Offline Dam

33. By 18 May 2008, or as otherwise agreed to by the Secretary, the Applicant shall:
    (a) modify the existing dam at the site to create a dam with a capacity of at least 61.4ML offline from Rocklow Creek;
    (b) ensure the discharge and overflow points of the dam do not cause erosion at the point of discharge/overflow;
    (c) rehabilitate and stabilize the banks of the dam;
    (d) construct a baffle and macrophyte zone downstream of the dam; and
    (e) ensure the integrity of the dam would not be compromised by any flooding in Rocklow Creek;
    to the satisfaction of the EPA and the Secretary.

34. Prior to carrying out any of these works, the Applicant shall prepare, and subsequently implement, a Dam Upgrade Plan in consultation with the EPA, and to the satisfaction of the Secretary. This plan must include:
    (a) the detailed design and specifications of the proposed works, which have been certified by a practicing registered engineer;
    (b) an erosion and sediment control plan for the proposed works, that is consistent with the requirements in the Department of Housing's *Managing Urban Stormwater: Soils and Construction* manual;
    (c) a vegetation and rehabilitation plan, setting out how the banks of the dam would be rehabilitated and stabilized, and the baffle and macrophyte zone would be constructed;
    (d) an acid sulfate soil management plan that is consistent with the *NSW Acid Sulfate Soil* manual;
    (e) a construction program for the proposed works; and
    (f) a program setting out how the modified dam and associated revegetation works would be maintained during the life of the development.

35. Within 1 month of completing the construction works in the Dam Upgrade Plan, the Applicant shall submit an as-executed report, certified by a practicing registered engineer, to the satisfaction of the EPA and Secretary.

Flocculant Management

36. [10]The Applicant shall not use a flocculant, other than alum or ferric chloride, without the written approval of the EPA.

37. [11]Prior to carrying out any of the construction works required in condition 33 above, the Applicant shall prepare, and subsequently implement, a Flocculant Management Plan for the development to the satisfaction of the EPA. This plan must:
    (a) describe the proposed dosing system, including procedures for dosing in different operating conditions procedures, and procedures to ensure excess flocculant dosing is prevented; and
    (b) describe how the performance of this system would be monitored over time.

Other Water Management Works

38. [12]Within 18 months of the date of this consent, the Applicant shall carry out the following works:
    (a) Workshop and Fuel Storage Area
    - desilt drains and culverts upstream of the workshop to limit flooding;
    - construct a first flush collection basin to capture and store the first 13mm of run-off from the external service bays before it is treated by the oil/water separator; and
    - bund and roof the drum storage area;

    (b) Magazine Area
    - reinstate drain through access road to magazines to direct stormwater flows to the main drain;

    (c) deleted

    to the satisfaction of EPA and the Secretary.

Bunding

[10] Incorporates EPA GTA
[11] Incorporates EPA GTA
[12] Incorporates EPA GTA

39. [13]Impervious bunds must be constructed around all fuel, oil and chemical storage areas and the bund volume must be large enough to contain 110 per cent of the volume held in the largest container. The bund must be designed and installed in accordance with the requirements of the EPA Environment Protection Manual Technical Bulletin *Bunding and Spill Management*.

Monitoring

40. The Applicant shall:
    (a) measure:
        - the volume of water discharged from the site via licenced discharge points;
        - water use on the site;
        - water transfers across the site;
        - dam and water structure storage levels;
    (b) monitor the quality of the surface water:
        - discharged from the licence discharge point/s of the development;
        - upstream and downstream of the development;
    (c) monitor flows in Rocklow Creek; and
    (d) monitor regional groundwater levels and quality;

    to the satisfaction of the EPA and the Secretary.

Management

41. Within 12 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Site Water Management Plan for the development, in consultation with the DPI - Water, and to the satisfaction of the Secretary. This plan must include:
    (a) the predicted site water balance;
    (b) an Erosion and Sediment Control Plan;
    (c) a Surface Water Monitoring Program
    (d) a Ground Water Monitoring Program; and
    (e) an Integrated Water Management Strategy.

42. The Erosion and Sediment Control Plan shall:
    (a) be consistent with the requirements of the Department of Housing's *Managing Urban Stormwater: Soils and Construction* manual;
    (b) identify activities that could cause soil erosion and generate sediment;
    (c) describe measures to minimize soil erosion and the potential for the transport of sediment to downstream waters;
    (d) describe the location, function, and capacity of erosion and sediment control structures; and
    (e) describe what measures would be implemented to maintain the structures over time.

43. The Surface Water Monitoring Program shall include:
    (a) detailed baseline data on surface water flows and quality in Rocklow Creek;
    (b) surface water impact assessment criteria;
    (c) a program to monitor surface water flows and quality in Rocklow Creek;
    (d) a program to monitor bank and bed stability in Rocklow Creek; and
    (e) a program to monitor the effectiveness of the Erosion and Sediment Control Plan.

44. The Ground Water Monitoring Program shall include:
    (a) detailed baseline data on ground water levels and quality, based on statistical analysis;
    (b) ground water impact assessment criteria; and
    (c) a program to monitor regional ground water levels and quality.

45. [14]The Integrated Water Management Strategy shall:
    (a) explore a range of options for a sustainable resource alternative for water supply to the site;
    (b) identification of all possible and available sources of water;
    (c) consistency with Government Water Reform initiatives and policies;
    (d) quality of water to meet usage requirements including any possible effects on product;
    (e) costs of supply;
    (f) health and environmental impacts;
    (g) legislative requirements;
    (h) assessment of the feasibility, benefits and costs of options;
    (i) a process to identify and evaluate preferred options for implementation; and
    (j) the identification of a timetable for implementation of the selected options.

FLORA AND FAUNA

[13] Incorporates EPA GTA
[14] Incorporates EPA GTA

Vegetation Offset Strategy

46. The Applicant shall:
    (a) establish, conserve, and maintain at least:
        - 4.6 hectares of *Melaleuca armillaris* Tall Shrubland; and
        - 8.2 hectares of Blue Gum-White Box Woodland/Forest,

        on Boral-owned land adjacent to the development; and
    (b) conserve, maintain, and enhance the vegetation in the area to the south of the development marked on the map in Appendix 2.
    (c) conserve, maintain, enhance and establish the vegetation in the area to the south of the development marked on the map in Appendix 3, in accordance with the letter from Boral to the Department dated 22 September 2008 titled *Dunmore Quarry – Revised Offset for Quarry Extension.*

46 A. Within 12 months of the date of Modification Application 470-11-2003 Mod 4, the Applicant shall make suitable arrangements in consultation with the OEH to provide appropriate long term security for the biodiversity offset referred to in condition 46 (c), to the satisfaction of the Secretary.

Flora and Fauna Management Plan

47. Within 12 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Flora and Fauna Management Plan for the development to the satisfaction of the Secretary. This plan must include:
    (a) a Vegetation Clearing Protocol;
    (b) a Compensatory Habitat Management Plan; and
    (c) a Remnant Vegetation Conservation Plan.

48. The Vegetation Clearing Protocol shall:
    (a) delineate the areas of remnant vegetation to be cleared; and
    (b) describe the procedures that would be implemented for:
        - pre-clearance surveys;
        - progressive clearing;
        - fauna management;
        - conserving and reusing topsoil;
        - collecting seed from the site;
        - salvaging and reusing material from the site; and
        - controlling weeds.

49. The Compensatory Habit Management Plan shall:
    (a) describe the compensatory habitat proposal for the:
        - *Melaleuca armillaris* Tall Shrubland; and
        - Blue Gum-White Box Woodland/Forest;
    (b) justify why this area(s) is suitable for the compensatory habitat proposal;
    (c) establish baseline data for the existing habitat in the proposed compensatory habitat area(s);
    (d) describe how the compensatory habitat proposal would be implemented;
    (e) set completion criteria for the compensatory habitat proposal; and
    (f) describe how the performance of the compensatory habitat management proposal would be monitored over time.

50. The Remnant Vegetation Conservation Plan shall:
    (a) describe what measures would be implemented to conserve, maintain and enhance the vegetation in the area to the south of the development marked in the map in Appendix 2;
    (b) establish baseline data for the existing vegetation in the area; and
    (c) describe how the performance of the measures described in (a) above would be monitored over time.

Reporting

51. The Applicant shall include a progress report on the implementation of the Flora and Fauna Management Plan in the Annual Review.

Independent Audit

52. Within 3 years of the date of this consent, and every 5 years thereafter unless the Secretary directs otherwise, the Applicant shall commission, and pay the full cost of an Independent Audit of the Flora and Fauna Management Plan. This audit must:
    (a) be conducted by a suitably qualified, experienced, and independent person whose appointment has been endorsed by the Secretary;
    (b) assess the performance of the Flora and Fauna Management Plan;
    (c) review the adequacy of the Flora and Fauna Management Plan; and, if necessary,
    (d) recommend actions or measures to improve the performance and/ or adequacy of the Flora and Fauna Management Plan.

REHABILITATION

Rehabilitation

53. The Applicant shall progressively rehabilitate the site to the satisfaction of the Secretary.

Rehabilitation Management Plan

54. Within 6 months of the date of this consent, the Applicant shall prepare, and subsequently implement, a Rehabilitation Management Plan for the site to the satisfaction of the Secretary. This plan must:
    (a) identify the disturbed area at the site;
    (b) describe in general the short, medium, and long-term measures that would be implemented to rehabilitate the site;
    (c) describe in detail the measures that would be implemented over the next 5 years to rehabilitate the site; and
    (d) describe how the performance of these measures would be monitored over time.

55. Within 5 years of providing the Rehabilitation Management Plan to the Secretary, and every 5 years thereafter, the Applicant shall review and update the plan to the satisfaction of the Secretary.

Rehabilitation and Conservation Bond

56. Within 6 months of the date of this consent, the Applicant shall lodge a suitable rehabilitation and conservation bond for the development with the Secretary. The sum of the bond shall be calculated at:
    (a) \$2.50/ m^2 for the area of disturbance at the development; and
    (b) \$3.00 /m^2 of the area of the compensatory habitat proposal (see Condition 49 above)
    to the satisfaction of the Secretary.

    Notes:
    - *If the rehabilitation and compensatory habitat proposal is completed to the satisfaction of the Secretary, the Secretary will release the rehabilitation and conservation bond.*
    - *If the rehabilitation and compensatory habitat proposal is not completed to the satisfaction of the Secretary, the Secretary will call in all or part of the rehabilitation and compensation bond, and arrange for the satisfactory completion of these works.*

57. Within 3 years of lodging the rehabilitation and conservation bond with the Secretary, and every 5 years thereafter, unless the Secretary directs otherwise, the Applicant shall review, and if necessary revise, the sum of the rehabilitation bond to the satisfaction of the Secretary. This review must consider:
    (a) the effects of inflation;
    (b) any changes to the area of disturbance; and
    (c) the performance of the compensatory habitat proposal.

Reporting

58. The Applicant shall include a progress report on the Rehabilitation Management Plan in the Annual Review.

TRAFFIC AND TRANSPORT

North Kiama Bypass

59. The Applicant shall facilitate access to the North Kiama Bypass along Tabbita Road in accordance with the terms set out in the Deed of Agreement between the Applicant and Dunmore Sand and Soil Pty Ltd, dated 29 July 2004.

Transport Management Plan

60. The Applicant shall prepare and implement a Transport Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared by a suitably qualified traffic consultant, in consultation with RMS and Council, and submitted to the Secretary for approval by 31 May 2014;
    (b) include a drivers' code of conduct for the development;
    (c) describe the measures that would be implemented to ensure:
        - all drivers of development-related vehicles comply with the drivers' code of conduct; and
        - compliance with the relevant conditions of this consent; and
    (d) include a program to monitor the effectiveness of the implementation of these measures.

Cumulative Traffic Impact Study

60A. The Applicant shall, in conjunction with the operators of the Bass Point Quarry and the Albion Park Quarry, cause to be prepared an independent Cumulative Traffic Impact Study. The study must:
    (a) be undertaken by a suitably qualified traffic consultant, whose appointment has been approved by the Secretary;
    (b) be commissioned by 30 June 2014, and completed by 31 October 2014, or as otherwise agreed in writing by the Secretary;
    (c) be co-funded by the operators of the Dunmore, Bass Point and Albion Park quarries, proportionate to the quarries' respective quarry product road transport limits, as approved at 30 June 2014;
    (d) include a comprehensive assessment of current and future projected cumulative traffic impacts of the three quarries on the classified road network, undertaken in consultation with the RMS; and
    (e) identify any reasonable and feasible measures that can be implemented to minimise the traffic and road safety impacts of quarry trucks on Mount Ousley Road, and the likely cost of implementing these measures.

60B. The Applicant shall, in conjunction with the operators of the Bass Point Quarry and the Albion Park Quarry, prepare and implement a program to implement any reasonable and feasible measures identified in the Cumulative Traffic Impact Study not already undertaken by the Applicant, in an equitable manner with the two other quarry operators, to the satisfaction of the Secretary. The program must be submitted to the Secretary for approval by 28 February 2015, or as otherwise agreed in writing by the Secretary.

Parking

61. The Applicant shall provide sufficient parking on-site for all quarry-related traffic to the satisfaction of the Secretary.

Road Haulage

62. The Applicant shall ensure that all loaded vehicles entering or leaving the site are covered.

63. The Applicant shall ensure all loaded vehicles leaving the site are cleaned of materials that may fall on the road before they are allowed to leave the site.

ABORIGINAL HERITAGE

64. The Applicant shall not destroy Aboriginal site DQ2 before it has obtained approval from the OEH under section 90 of the *National Parks & Wildlife Act 1974*.

Notes:

- *The OEH has indicated that it will issue this approval subject to conditions.*
- *If a salvage component (including "community collection") is to accompany the application under section 90, the application should include a methodology/research design for the salvage activity, and an application for care and control of any recovered and collected Aboriginal objects by the Aboriginal community involved.*

65. Within 6 months of the date of this consent, the Applicant shall conserve Aboriginal site DQ2004/1 in consultation with the Aboriginal community, and to the satisfaction of the OEH.

VISUAL IMPACT

Visual Amenity

66. The Applicant shall minimise the visual impacts of the development to the satisfaction of the Secretary.

67. Prior to carrying out any development that would be visible from the areas to the south west of the quarry, the Applicant shall construct, and subsequently maintain, the proposed visual/ noise bund between the Croome Farm extraction area and the Jamberoo Valley to the satisfaction of the Secretary.

67A. The Applicant shall:
   a) construct the blending plant in the location shown on the figure in Appendix 4; and
   b) ensure the maximum height of the blending plant is no greater than 15.2 m.

Lighting Emissions

68. The Applicant shall take all practicable measures to prevent and/or minimise any off-site lighting impacts from the development.

69. All external lighting associated with the development shall comply with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*.

WASTE MANAGEMENT

Waste Minimisation

70. The Applicant shall minimise the amount of waste generated by the development to the satisfaction of the Secretary.

Waste Classification

71. [15]All liquid and non liquid wastes resulting from activities and processes at the site must be assessed, classified and managed in accordance with the EPA's Environmental Guidelines*: Assessment, Classification and Management of Liquid and Non-liquid Wastes (1999),* or any other EPA document superceding this guideline.

Reporting

72. The Applicant shall describe what measures have been implemented to minimise the amount of waste generated by the development in the Annual Review.

EMERGENCY AND HAZARDS MANAGEMENT

Dangerous Goods

73. The Applicant shall ensure that the storage, handling, and transport of dangerous goods is done in accordance with the relevant Australian Standards, particularly AS1940 and AS1596, and the Dangerous Goods Code.

Safety

74. The Applicant shall secure the development to ensure public safety to the satisfaction of the Secretary.

Emergency Management

75. [16]Within 6 months of the date of this consent, the Applicant shall document, and subsequently implement measures to minimise the environmental impacts of any emergency situations that could arise as a result of the operation of the Dunmore Quarry to the satisfaction of the EPA. This documentation must:

[15] Incorporates EPA GTA
[16] Incorporates DECC GTA

(a) identify any significant threats to the environment and/ or public health that could arise from activities associated with the operation of the quarry or construction works associated with the production increase. These threats may include excessive rainfall, problems during construction and operation, pump failures, excess flocculation, power or other utility failure, natural disaster, landslip, accidental spills and discharges, train derailment, spillage from trucks, fire etc;
(b) identify any subsequent direct or indirect environmental effects as a result of the threats;
(c) identify the pollution that would result due to these threats and impacts on operations and what impact the pollution would have on the health of the community and the environment;
(d) develop actions to effectively respond to the disruption of operations so the risk of pollution is minimised;
(e) develop a communications strategy for alerting relevant agencies and the potentially affected community in the event of the disruption to operations leading to significant pollution;
(f) ensure that all relevant employees are familiar with the documentation; and
(g) when developing this documentation identify any opportunities to integrate with Boral Emergency plans.

BUSHFIRE MANAGEMENT

76. The Applicant shall:
(a) ensure that the development is suitably equipped to respond to any fires on-site; and
(b) assist the Rural Fire Service and Emergency Services as much as possible if there is a fire on-site.

77. Within 6 months of the date of this consent, the Applicant shall prepare a Bushfire Management Plan for the development, to the satisfaction of Council and the Rural Fire Service.

PRODUCTION DATA

78. The Applicant shall:
(a) provide annual production data to the DRE using the standard form for that purpose; and
(b) include a copy of this data in the Annual Review.

SCHEDULE 5
ENVIRONMENTAL MANAGEMENT, MONITORING, AUDITING AND REPORTING

ENVIRONMENTAL MANAGEMENT STRATEGY

1. Within 6 months of the date of this consent, the Applicant shall prepare, and subsequently implement, an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:
   a) provide the strategic context for environmental management of the development;
   b) identify the statutory requirements that apply to the development;
   c) describe in general how the environmental performance of the development would be monitored and managed during the development;
   d) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the development;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the course of the development;
      - respond to any non-compliance;
      - manage cumulative impacts; and
      - respond to emergencies; and
   e) describe the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the development.

1 A. Deleted.

2. Within 14 days of receiving the Secretary's approval for the strategy, the Applicant shall:
   a) send copies of the approved strategy to the relevant agencies and Council; and
   b) ensure the approved strategy is made publicly available during the development.

ENVIRONMENTAL MONITORING PROGRAM

3. Within 6 months of the date of this consent, the Applicant shall prepare an Environmental Monitoring Program for the development, in consultation with the relevant agencies, and to the satisfaction of the Secretary. This program must consolidate the various monitoring requirements in Schedule 4 of this consent into a single document.

4. The Applicant shall regularly review, and if necessary update, this program in consultation with the Secretary.

ANNUAL REVIEW

5. The Applicant shall prepare and submit an Annual Review to the Secretary and the relevant agencies. This report must:
   a) identify the standards and performance measures that apply to the development;
   b) describe the works carried out in the last 12 months;
   c) describe the works that will be carried out in the next 12 months;
   d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;
   e) include a summary of the monitoring results for the development during the past year;
   f) include an analysis of these monitoring results against the relevant:
      - impact assessment criteria;
      - monitoring results from previous years; and
      - predictions in the EIS;
   g) identify any trends in the monitoring results over the life of the development;
   h) identify any non-compliance during the previous year; and
   i) describe what actions were, or are being taken to ensure compliance.

INDEPENDENT ENVIRONMENTAL AUDIT

6. Prior to 1 April 2014, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
   (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
   (b) include consultation with the relevant agencies;

(c) assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent and any relevant EPL (including any assessment, plan or program required under these approvals);
(d) review the adequacy of any approved strategy, plan or program required under these approvals; and
(e) recommend measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under these approvals.

Note: This audit team must be led by a suitably qualified auditor and include experts in any field specified by the Secretary.

7. Within 3 months of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary, with a response to the recommendations contained in the audit report.

COMMUNITY CONSULTATIVE COMMITTEE

8. Within 3 months of the date of this consent the Applicant shall seek expressions of interest from members of the local community to serve as a member of a Community Consultative Committee for the development.

9. The Applicant shall maintain the Community Consultative Committee (CCC) for the development to the satisfaction of the Secretary. This CCC must be operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007, or its latest version).

Notes:
- *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent.*
- *In accordance with the guideline, the Committee should comprise an independent chair and appropriate representation from the Applicant, Council, recognised environmental groups and the local community.*

REPORTING

Incident Reporting

10. The Applicant shall immediately notify the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the development, the Applicant shall notify the Secretary and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant shall provide the Secretary any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

11. The Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.

ACCESS TO INFORMATION

12. By 1 May 2014, the Applicant shall:
(a) make the following information publicly available on its website:
- current statutory approvals for the development;
- approved strategies, plans or programs;
- a summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent;
- a complaints register, updated on a quarterly basis;
- minutes of CCC meetings;
- copies of any Annual Reviews or Annual Environmental Management Reports (over the last 5 years);
- any independent environmental audit, and the Applicant's response to the recommendations in any audit; and
- any other matter required by the Secretary; and

(b) keep this information up to date,
to the satisfaction of the Secretary.

REVISION OF STRATEGIES, PLANS AND PROGRAMS

13. Within 3 months of:

(a) the submission of an Annual Review under condition 5 of Schedule 5;

(a1) the submission of an audit report required under condition 6 of Schedule 5;

(b) the submission of an incident report under condition 10 of Schedule 5; or

(c) a modification to the conditions of this consent (unless the conditions require otherwise), the Applicant shall review the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.

Note: The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the development.

APPENDIX 1
SCHEDULE OF LAND

Land to which the Development Application refers:

Local Government Area:

Shellharbour

Suburb, town or locality:

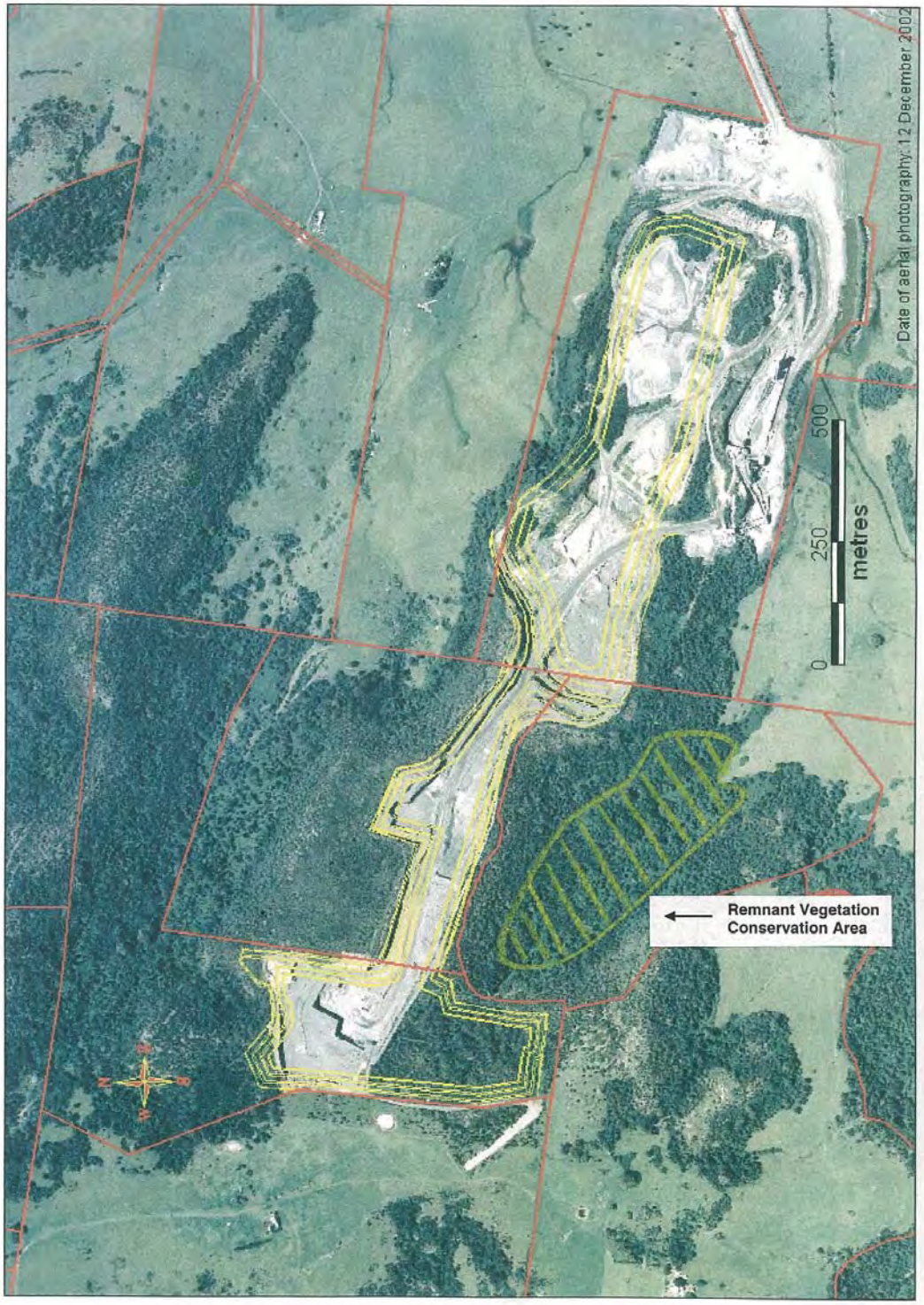
Dunmore

Land:

Lot No.	DP No.
Lot 1	DP 213575
Lot 3	DP 1030504
Lot 4	DP 1030504
Lot 4	DP 227046
Lot 1	DP 1002951
Lot 1	DP 224597
Lot 2	DP 224597
Lot 4	DP 571406
Lot 6	DP 1001931

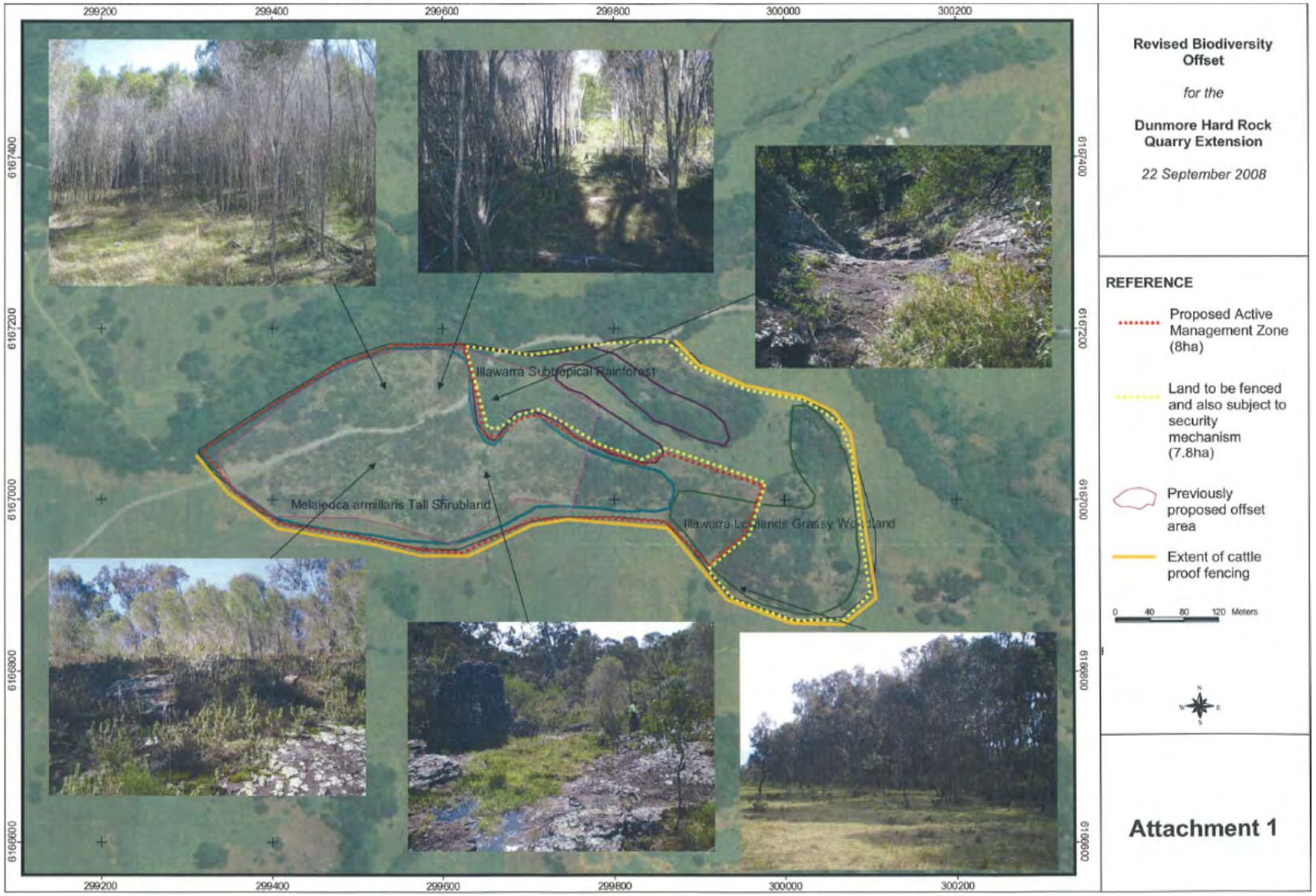
APPENDIX 2

REMNANT VEGETATION CONSERVATION AREA



APPENDIX 3

BIODIVERSITY OFFSET



Appendix 4
Location of Blending Plant

FIGURE 3
Blending plant location

DUNMORE HARD ROCK QUARRY - PROPOSED BLENDING PLANT

ARCADIS Design & Consultancy for natural and built assets